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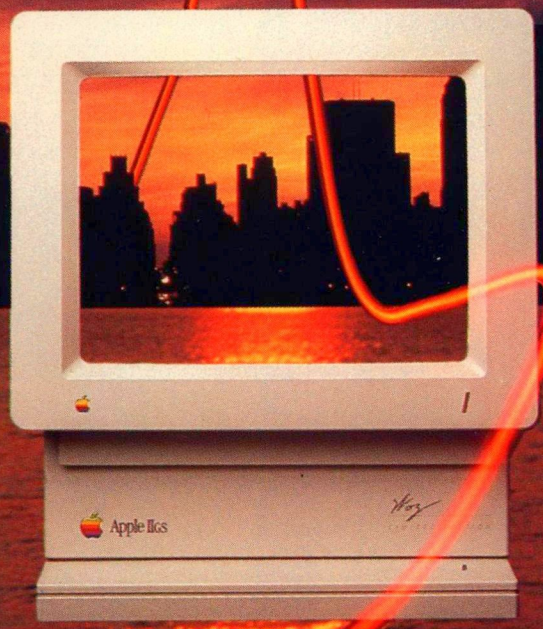

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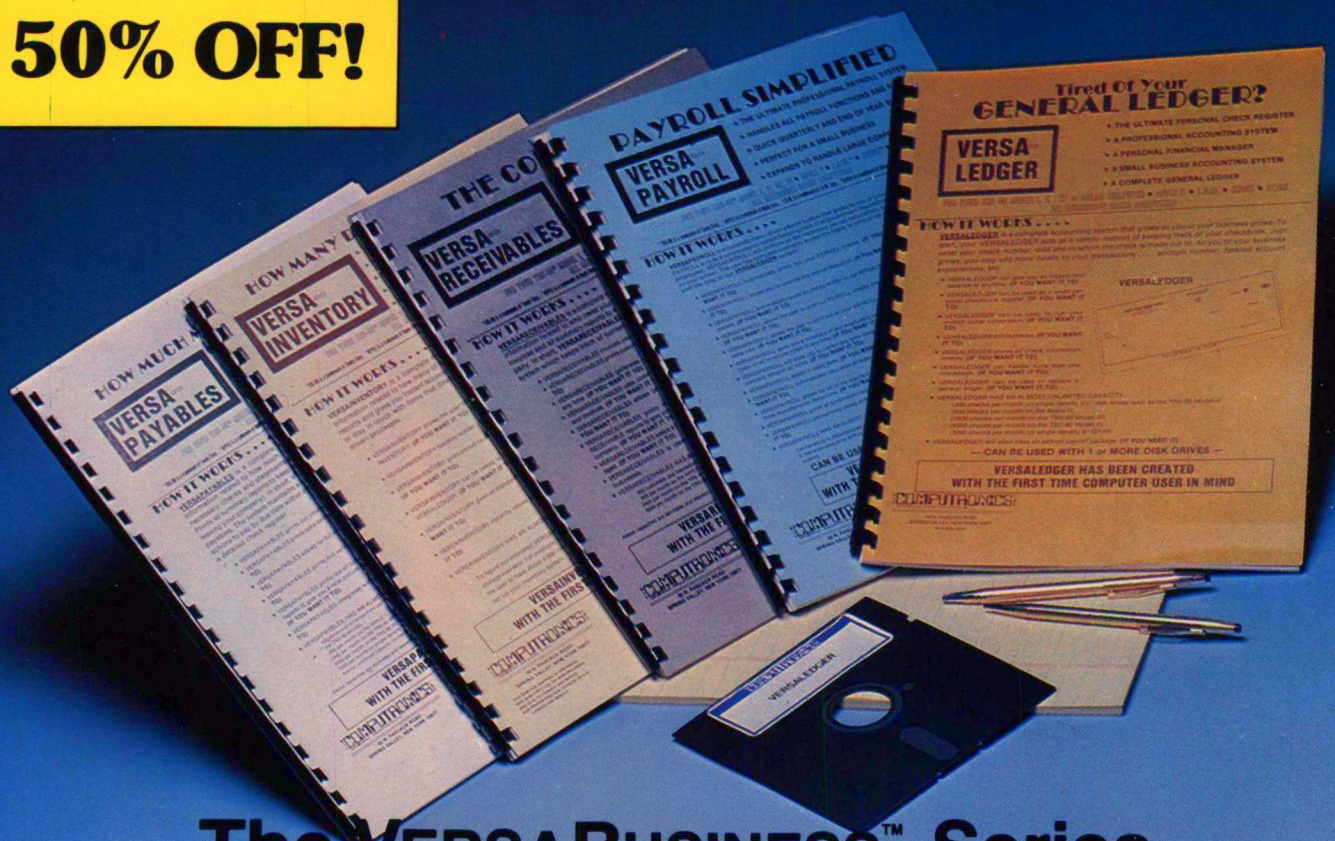

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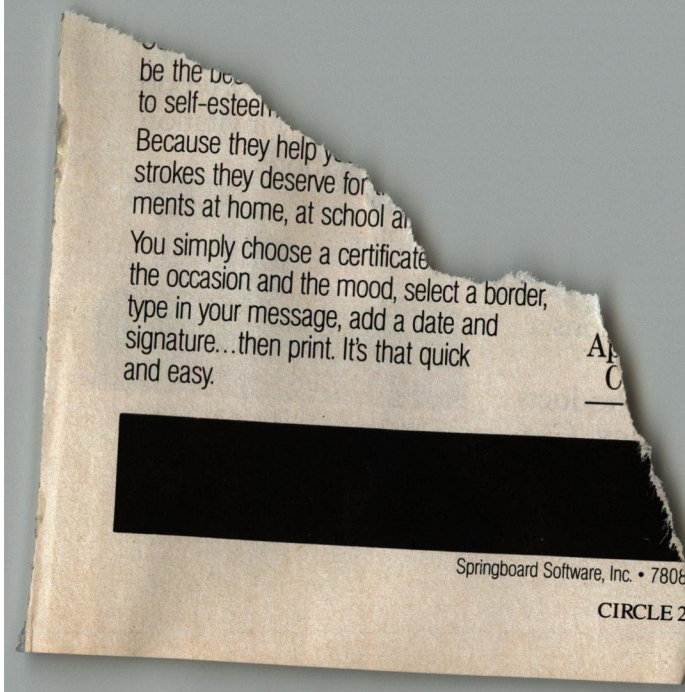
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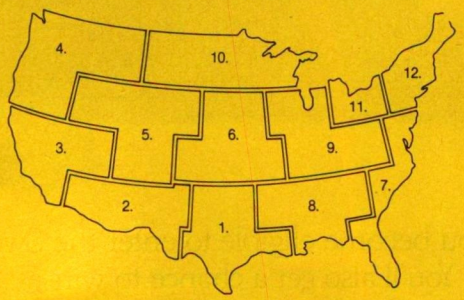

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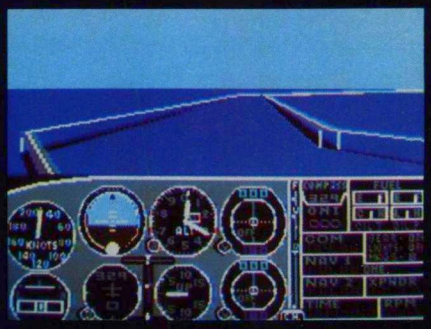

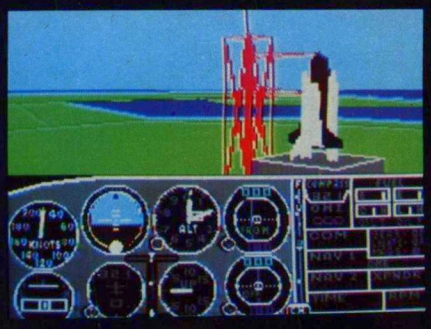

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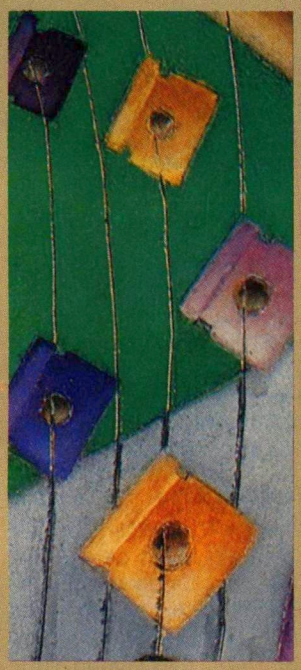

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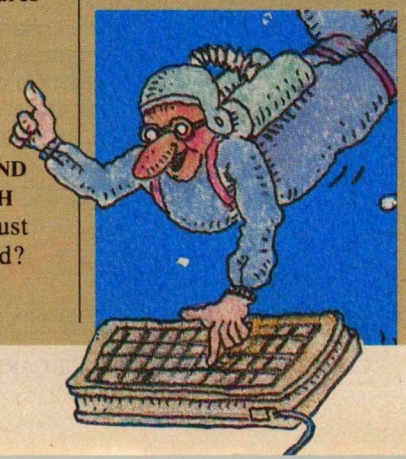

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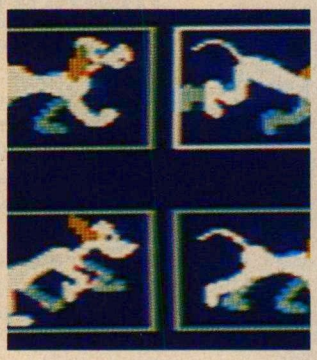

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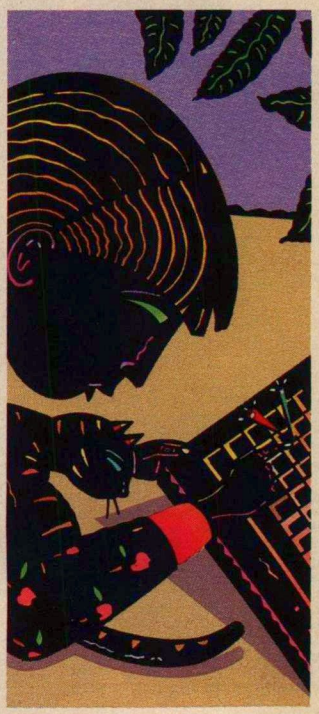

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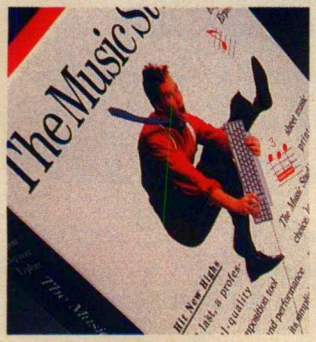

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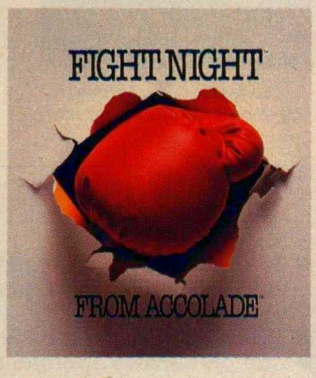

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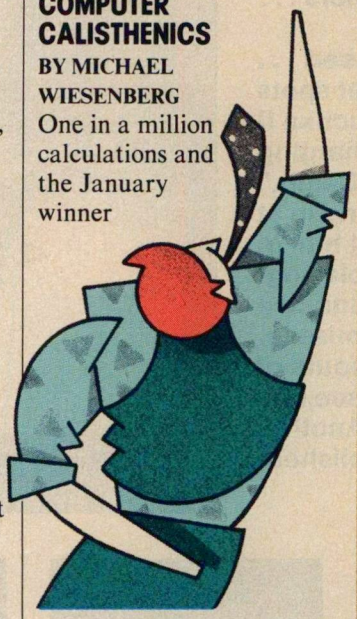

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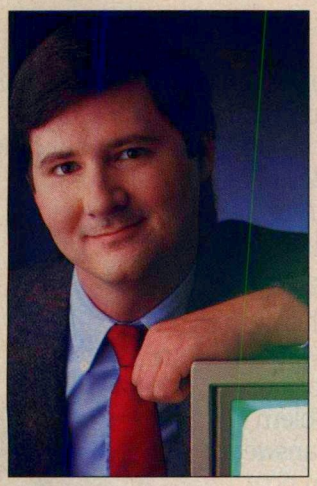

I think that the biggest benefit of telecommunications is the ability to connect your Apple to a large on-line service.

NO COMPUTER IS AN ISLAND

The theme of this month's issue is telecommunications. The term *telecommunications* refers to connecting your computer to another computer using a modem, a device that allows computers to exchange information over an ordinary telephone line. Apple owners use telecommunications for three main purposes: connecting to another microcomputer for exchanging files, using the Apple as a remote terminal for operating a minicomputer or a mainframe, and accessing on-line services such as GEnie, CompuServe, The Source, MCI Mail, Dialog, and BRS.

Connecting your Apple to another microcomputer can be useful for sending files back and forth. If the other computer is also an Apple and if you have the right software, you can exchange any type of file, including text files, graphics, and non-copy-protected software. If you are connecting to a computer in a different family such as the Macintosh or IBM PC series, you won't be able to exchange graphics or software simply, but you can easily exchange most types of text and numeric information. This ability allows you to break down compatibility barriers and access word-processing, database, and spreadsheet files from other computers such as the Mac or PC.

Connecting your Apple to a minicomputer or mainframe allows you to tap the power of these larger systems. Apple II computers have long been popular as remote terminals for DEC (Digital Equipment Corporation) minis and mainframes because software was readily available that let an Apple II emulate a VT100 terminal, a type of terminal that many of DEC's larger computers use. Now software is available that lets the Apple II emulate not just the VT100 terminal but also terminals from such diverse manufacturers as Televideo, IBM, and Lear-Siegler.

I think that the biggest benefit of telecommunications, however, is the ability to connect your Apple to a large on-line service. Services such as GEnie, CompuServe, and The Source give you the means to exchange information and ideas with other computerists around the country as well as providing other services such as computer shopping, software libraries, and airline flight information. MCI Mail provides worldwide electronic mail and Telex service and a link to the Dow Jones News/Retrieval System, which provides up-to-the-minute business news and stock-market information. And then there are my two favorite on-line services: Dialog and BRS. These two services are enormous repositories of information containing data on virtually every topic culled from tens of millions of books, magazines, journals, lectures, and Ph.D. dissertations from around the world. Dialog and BRS represent the largest and most easily accessed bodies of information ever known to civilization. In today's society, information is power; Dialog and BRS are extremely powerful tools if you know how to use them.

Whether you are connecting your Apple to another Apple, an IBM PC, a minicomputer, or an on-line service, you are going to need two things in addition to your computer: a modem and a telecommunications software package. To help you get the modem and software you need, we have put together this special telecommunications issue of *A+*. In the following pages, hardware expert Gary Little takes a look at modems in "A Hardware Buyer's Guide;" longtime Apple specialist Michael Fischer sheds some light on choosing a telecommunications package in his article "Selecting Software;" our regular telecommunications columnist Russ Lockwood takes a look at the exciting world of on-

Is Getting The Answer To Software Problems A Bigger Problem Than The Problem?

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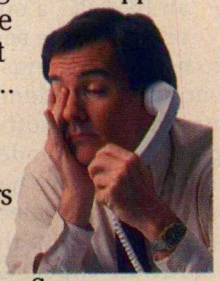
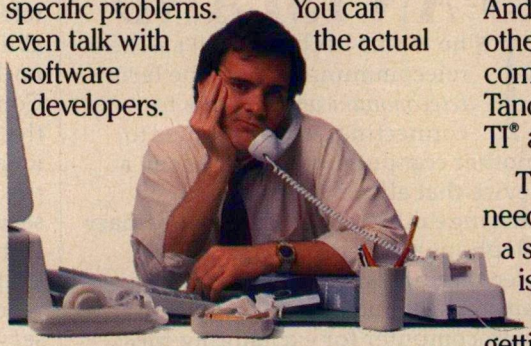


Several prominent, progressive software publishers recognize this problem, and working with CompuServe, have developed a solution—CompuServe Software Forums.

Now you can go online with experts from the companies that produced your software and get prompt, written answers to your specific problems. You can even talk with the actual software developers.



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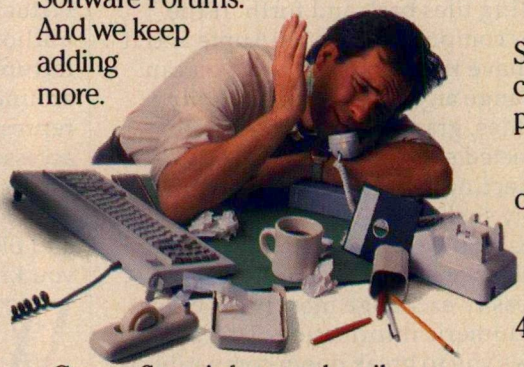

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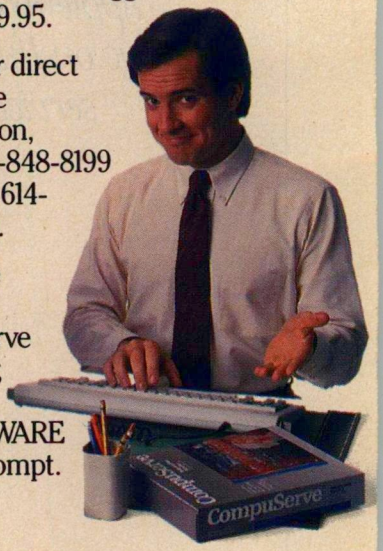

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line services in "A Guide to the On-Line Galaxy;" and the *A+* staff has gone to great lengths to provide you with comprehensive charts of modems and software to help you in your buying decisions.

Welcome, *MacUser!*

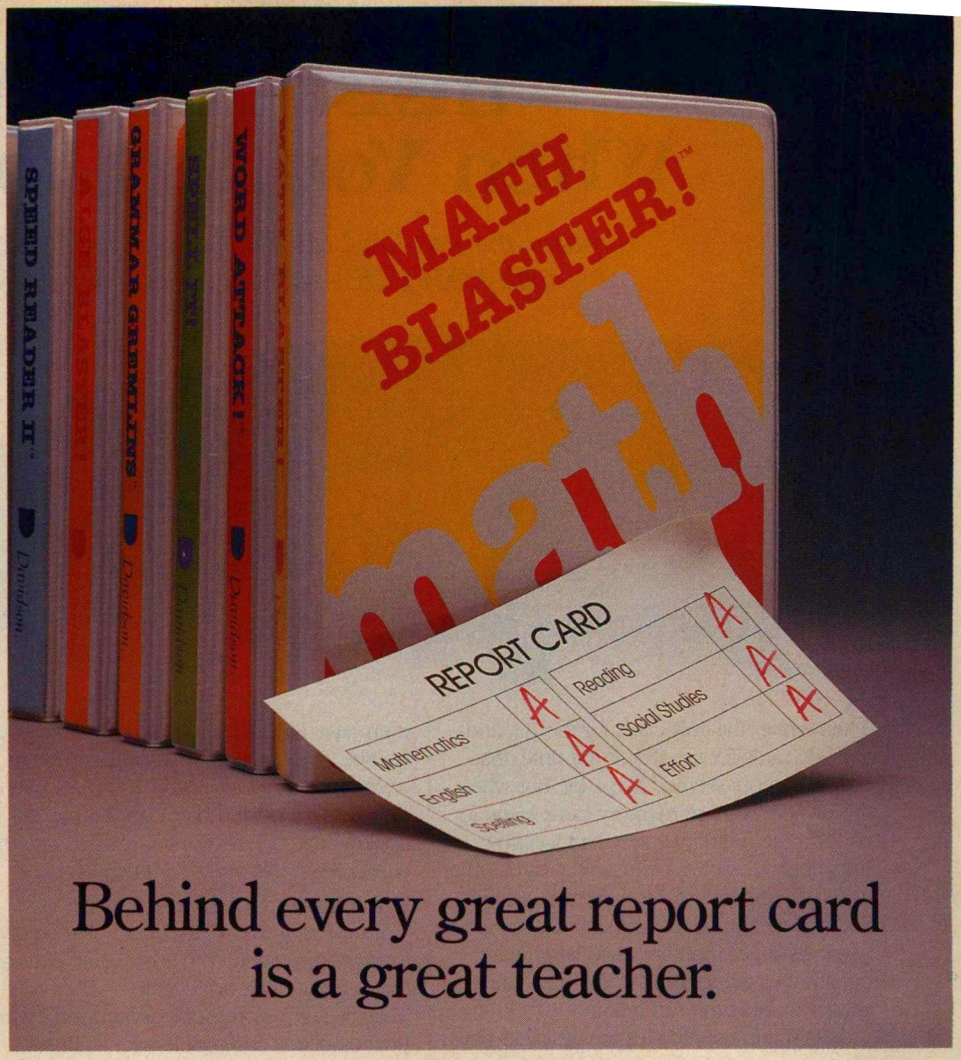
Well, now I can finally tell you the whole story behind why *A+* dropped its Macintosh section. I know from your letters that many of you were disappointed to see us drop this section. We did have a good reason, though. As the Mac gained momentum, we realized that too much was happening in both the Macintosh and Apple II markets for us to adequately cover both families of computers in *A+*. Since *A+* has always been the leading Apple II publication, we decided to focus *A+* entirely on the Apple II line and seek another publication to devote to Macintosh coverage. We decided we could start our own magazine or, better yet, acquire an existing Macintosh magazine to save the expense of having to start from scratch.

After months of secret negotiations, the parent company of *A+* announced that it had purchased *MacUser*, the fastest-growing magazine devoted to the Macintosh computer. The negotiations began last fall, and we hoped to be able to announce our purchase of *MacUser* simultaneously with our announcement of the refocusing of *A+*. But, as often happens in the business world, the negotiations dragged on, and we were unable to make the transition as smooth as we would have liked.

As this issue went to press, the dust hadn't completely settled yet. You'll be hearing more from us about *MacUser* soon, though. So if you want the best information about the Macintosh, we can now offer you *MacUser*, and *A+*'s exclusive focus on the Apple II series will allow us to be your number 1 source for Apple II information. Again, welcome, *MacUser*! +

Fred

FREDERIC E. DAVIS/**EDITOR IN CHIEF**



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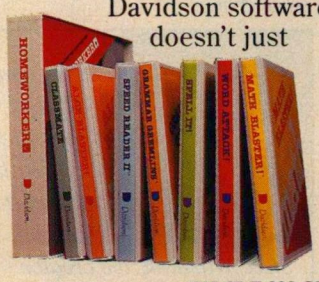

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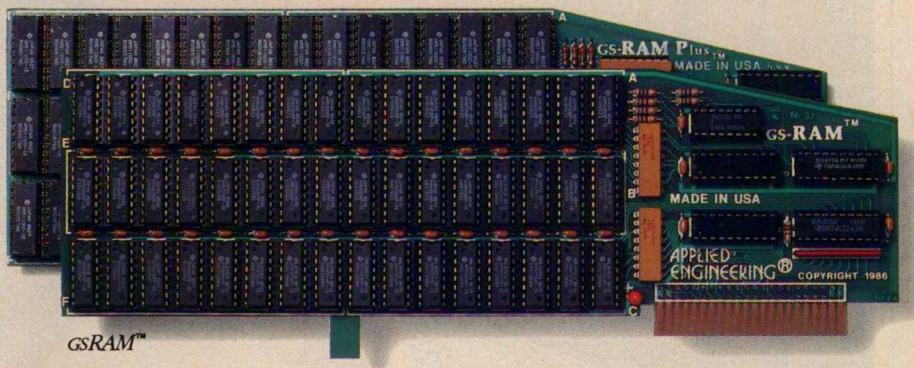

GSRAM™

Remember the 16K cards for the II+ and the 64K cards for the IIe? At the time, that much memory seemed like a lot. But when the owners of these memory cards came to us for more memory, many had to throw away their smaller Apple memory cards or try to sell them. Most of our customers told us that had they known about Applied Engineering's larger memory cards when they bought their Apple, they would have purchased them at the same time.

GSRAM and GSRAM Plus are available now, allowing up to 8 MEG of memory expansion. That's 8 times the memory capacity of Apple's card and just look at the benefits that only GSRAM and GSRAM Plus have over Apple's card:

- Lower cost
- Has 6 RAM banks (Apple's card has 4)
- Has memory expansion port
- Has ROM expansion port
- No configuration blocks to set
- No soldered in RAM chips
- Expandable to 8 MEG
- Expands AppleWorks internal limits
- Built-in Hi-Res self-diagnostic software
- 5 year hassle free warranty (Apple has a 90 day warranty)
- Made in USA

GSRAM for More AppleWorks Power

Only GSRAM and GSRAM Plus eliminates AppleWorks internal memory limits, increasing the maximum number of records available from 6,000 to over 25,000 and only GSRAM and GSRAM Plus increases the number of lines permitted in the word processing mode from 6,000 to over 15,000. And only GSRAM and GSRAM Plus offers a built-in printer buffer so you can continue using AppleWorks while your printer is printing. GSRAM and GSRAM Plus even expand the number of lines in the clipboard from 255 to 2047 and will auto segment large files so they can be saved on two or more disks. You can even have Pinpoint or Macroworks and your favorite spelling checker in RAM for instant response. GSRAM and GSRAM Plus will even display the time and date right on the AppleWorks screen. Nothing comes close to enhancing AppleWorks so much.

Turn Your IIGS into a Giant

Simply plug GSRAM into the IIGS memory expansion slot and you've got up to *8 megabytes* of RAM at your fingertips—all of it instantly and automatically recognized by the IIGS. GSRAM is compatible with all IIGS software, including AppleWorks, as well as BASIC®, ProDos, DOS 3.3, PASCAL®, "C" and CP/M®.

Grow by Bytes or Megabytes

We offer GSRAM in two configurations so you can increase your memory 256K at a time (GSRAM) or a megabyte at a time (GS-RAM Plus). Both offer full compatibility, lower cost than other boards, and easy expandability. And both are extremely low in power consumption. A fully expanded GSRAM operates at only 375 ma, and GSRAM Plus at only 270 ma (even with 6 megabytes on board!)

GSRAM—for Normal Memory Requirements

GSRAM is available with 256K, 512K, 1 MEG or 1.5 MEG of memory already on board. If you don't need the full 1.5 MEG now, you can choose a GSRAM with less memory and expand it up to 1.5 MEG in the future—or upgrade to GSRAM Plus for a small charge.

"I recommend Applied Engineering products wholeheartedly."

Steve Wozniak, the creator of Apple Computer

With an optional piggyback card, you can expand GSRAM even higher than 1.5 MEG! (Other cards are only expandable to 1 MEG.)

GSRAM Plus—for Growing by Leaps and Bounds

GSRAM Plus is the first Apple memory card to use 1 MEG RAM chips on the main board. It's available with 1 to 6 MEG on board. If you don't need the whole 6 MEG now, you can buy a GSRAM Plus with less memory and easily expand it in the future.

GSRAM Plus can be expanded up to 8 MEG with an optional piggyback card.

Easy Expansion

Both GSRAM and GSRAM Plus use standard RAM chips that are readily available and just plug right in. So unlike other cards, you'll find expanding your GSRAM or GSRAM Plus easy, convenient and very economical. And with our optional ROM expansion module you can even increase the IIGS's ROM space and all in just one slot.

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Applied Engineering is the largest supplier of Apple peripherals in the world. We *invented* the first large RAM cards for the Apple. With a 5-year "no-hassle" warranty and outstanding technical support, you can be sure GSRAM and GSRAM Plus will deliver the performance you're looking for—or return them within 15 days for a full refund.

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GSRAM with 1 MEG	**$299**
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GSRAM with 2-8 MEG	**CALL**
GSRAM Plus with 1-8 MEG	**CALL**

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Letters

We invite your comments.

THE APPLE IIc IS GOOD ENOUGH FOR BUSINESS

Dear *A+*: I read with a great deal of satisfaction Mark Strothman's comments regarding his Apple IIc. As vice president of an Apple computer users' group and an everyday user of my IIc for work, I often hear comments about the IIc being more of a toy or beginners' computer than a machine that can run business software. Those comments are even made by Apple Computer representatives.

I am occasionally tempted to upgrade to the new IIGS or a Macintosh because of those comments, but each time I look at one of those machines, I ask myself why I should.

What can the IIGS, the Macintosh, or, for that matter, the IIe give me that I can't have with my IIc? Admittedly, there are features of all those machines that make parts of my IIc somewhat inadequate by comparison. But do I need those features? Not to run a business—and all I use for that is AppleWorks with AutoWorks and MultiScribe for special fonts.

If I want to play, some of the Macintosh and IIGS features appeal to me. I just don't have all that much time to play, so I'll probably stick to my IIc. There aren't many bells and whistles on the IIc, but it seems to get the job done.

I feel some sympathy now for people such as H.G. Payne, Jr., who owns an Apple II Plus and complains of Apple's not providing upgrades for that machine to a IIGS. While Apple hasn't forgotten us completely, it's hard for me to see a promising future. I'm just glad there are companies out there such as Checkmate Technology that haven't forgotten IIc owners and that allow us to take full advantage of our computers.

Ed Spitler
Apple Valley, MN

THE GS FEVER

Dear *A+*: The alarm went off and I arose from a General Stupor. It was time for the day to Get Started. I Got Showered, Got Shaved, and got dressed in my Grey Slacks & Gold Sweater. I got my Gentleman's Saddleshoes from my Gucci Shoetree. I grabbed a Granny Smith apple on the way out the door for breakfast, and I realized it was going to be another GS day. On the way to work I played the Good Samaritan as I rescued a German Shepherd that was about to be run over by a Green Sirocco. I work as a disc jockey at the local radio station. I start my show with "Keep Your Hands to Yourself" from Georgia Satellites, and four hours later I end the show with "The Sounds of Silence" by Garfunkle & Simon. If you think this story is Getting Silly or is Generally Stupid, you're probably right. So what's the point?

It's GS fever!! It seems to be catching on fast. I noticed in your articles in the February issue that many of the writers for *A+* seem to have it. Gary Little seems to recommend purchasing the whole new system for most users, whereas Frederic Davis says he will be purchasing the upgrade. I have owned a IIe for more than two years, and I love it. I have put the AppleWorks database module to unique uses in helping to program the radio station I work for. I also became the local AppleWorks authority and have begun teaching AppleWorks classes at Computerland of Hays.

Now I have the GS fever and I can't even sleep at night. The uses for the sound capabilities of the new IIGS in radio promise to be astounding. I am in the process of selling my motorcycle and my much beloved IIe to purchase the cure. For devoted Apple fans, the GS is a must. It is rapidly becoming the Gold Standard in Apple computing. I am very happy to see that Apple Computer, Inc. extended its rebate offer on IIGS addons until March 14, 1987, because of their lack of availability before Christmas. This could mean up to $250 off the system price. That to me means Great Savings.

Kurt Brecheisen
Program Director—KJLS Radio
Hays, KS

ADVERTISER INTEGRITY

Dear *A+*: I am writing this letter to brag about several of your advertisers. I am an Apple IIe user who purchased my system about eight months ago, and in that time I have purchased quite a few items, software and hardware, from various mail-order vendors. Every product I've purchased has been because of advertisements I've seen in your magazine, and I have yet to have one bad experience. This, in my opinion, says much about the integrity of your magazine.

Two companies I've dealt with have been extraordinarily good. These are Preferred Computing of Dallas, Texas, and Roger Wagner Publishing Company of Santee, California. These two companies have gone beyond the call of duty several times with fast service and terrific support.

When MouseWrite 2.6.8 came out this fall, I was quick to sign up for a copy, and when it arrived, it was just as good as I had hoped. Unfortunately, I had a terrible time trying to get my ImageWriter II to print the custom fonts, so I wrote the com-

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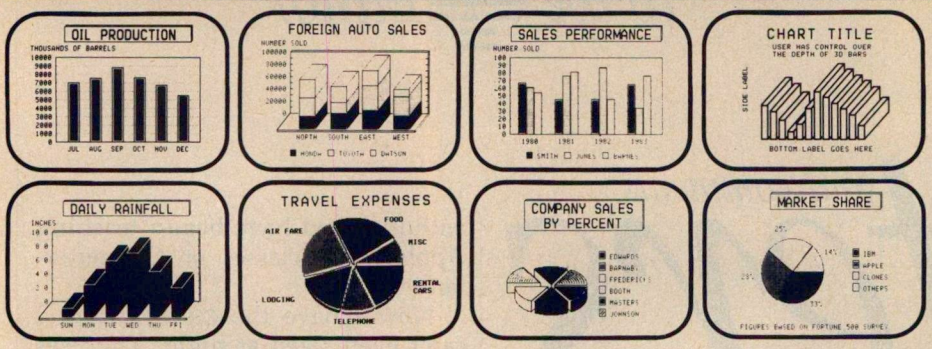

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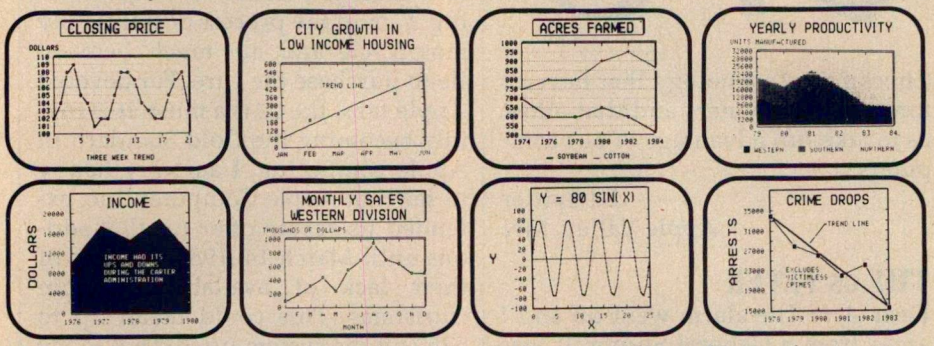

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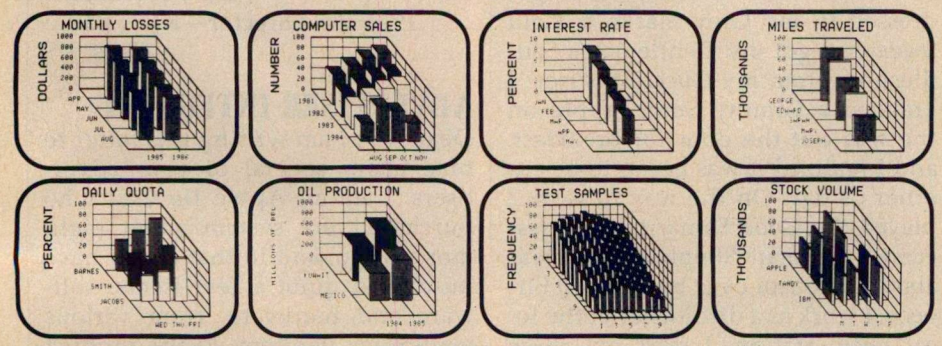

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pany asking for some assistance with it. Within two days, a technical-support person was working with me on the phone and solved my problems in ten minutes!

Preferred Computing is an outstanding company with the fastest shipping and best prices I have yet to find. Twice I have ordered hardware from them and somehow they seem to get it to me within three days UPS. Their policy, "call before 3:00 P.M. and it ships today," is obviously no joke!

One other company I would like to mention is Central Point Software. These people are very helpful with information and also very fast with their service.

These companies reflect upon the kind of magazine I think *A+* is—first class! I look forward to my copy every month, and I hope your standards continue to be high.

Philip E. Corbit
Radcliff, KY

MAIL-ORDER KUDOS

Dear *A+*: First of all, congratulations on your decision to devote all of *A+* to the Apple II series. It feels better not to have to sift through the new products and feel neglected when they won't work with the IIs.

Reflecting on the harrowing tales of fellow readers' collective negative experience with the mail-order side of the DP industry, it was not without some trepidation that I jumped into that market last week.

Living in this bucolic region is a pleasure on a lot of levels, but it leaves much to be desired in terms of access to the new and innovative. So I drew on one of the smaller display ads, for a company that promised only better prices but that also delivered personal service! I got a phone inquiry from the company, Computers Plus, of Phoenix, Arizona, regarding the type of printer I am using, and, incredibly, received the ordered product on the following day, even though I had paid by personal check!

Such excellent service deserves recognition and could serve to erase the negativity associated in some people's minds with the mail-order industry. I, for one, will continue to shop in this manner, at least from the above vendor.

Robert L. Dubin
Petaluma, CA

A disk each month delivered to you...
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DISCOVER UPTIME. You deserve the best from your Apple. Have the best and save the most with UPTIME.

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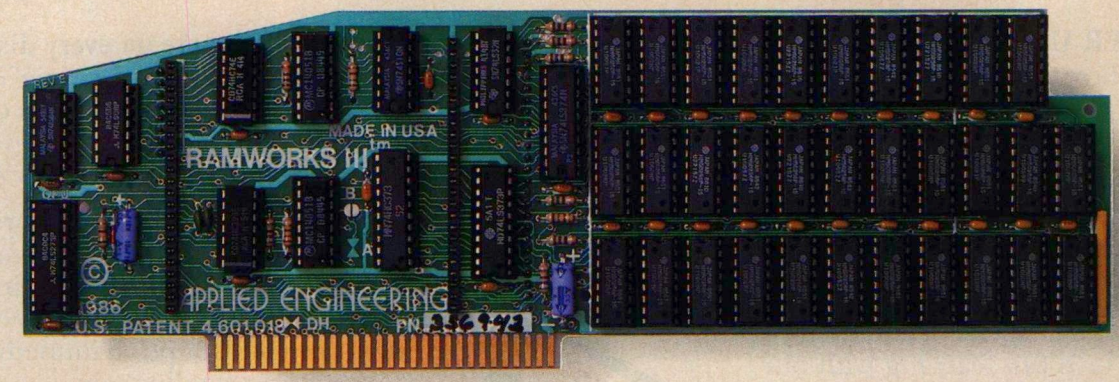


With battery backed RAM port, RGB port, increased memory capacity, full software compatibility and more compact design, RamWorks III is a generation ahead.

RamWorks III is the newest 3rd generation RAM card for the Apple IIe. It incorporates all of the technology and improvements that years of experience and over a hundred thousand sales have given us. By selling more memory cards than anyone else and listening to our customers, we were able to design a memory card that has the ultimate in performance, quality, compatibility and ease of use. A design so advanced it's patented. We call it RamWorks III, you'll call it awesome!

The AppleWorks Amplifier.

While RamWorks III is recognized by all memory intensive programs, NO other expansion card comes close to offering the multitude of enhancements to AppleWorks that RamWorks III does. Naturally, you'd expect RamWorks III to expand the available desktop, after all Applied Engineering was a year ahead of everyone else *including Apple* in offering more than 55K, and we still provide the largest AppleWorks desktops available. But a larger desktop is just part of the story. Look at all the AppleWorks enhancements that even Apple's own card does not provide and *only* RamWorks III does. With a 256K or larger RamWorks III, *all* of AppleWorks (including printer routines) will automatically load itself into RAM dramatically increasing speed by eliminating the time required to access the program disk drive. Switch from word processing to spreadsheet to database at the speed of light with no wear on disk drives.

Only RamWorks eliminates AppleWorks' internal memory limits, increasing the maximum number of records available from 1,350 to over 25,000. *Only* RamWorks increases the number of lines permitted in the word processing mode from 2,250 to over 15,000. And *only* RamWorks offers a built-in printer buffer, so you won't have to wait for your printer to stop before returning to AppleWorks. RamWorks even expands the clipboard. And auto segments large files so they can be saved on two or more disks. You can even have Pinpoint or MacroWorks and your favorite spelling checker in RAM for instant response.

RamWorks, nothing comes close to enhancing AppleWorks so much.

The Most Friendly, Most Compatible Card Available.

Using RamWorks III couldn't be easier because it's compatible with more off-the-shelf software than any other RAM card. Popular programs like AppleWorks, Pinpoint, Catalyst, MouseDesk, Howard-Soft, FlashCalc, Pro-Filer, Managing Your Money, SuperCalc 3a, and MagiCalc to name a few (and *all* hardware add on's like ProFile and Sider hard disks). RamWorks is even compatible with software written for Apple cards. But unlike other cards, RamWorks plugs into the IIe auxiliary slot providing our super sharp 80 column text (U.S. Patent #4601081) in a completely integrated system while leaving expansion slots 1 through 7 available for other peripheral cards.

RamWorks III is compatible with all Apple IIe's, enhanced, unenhanced, American or European versions.

Highest Memory Expansion.

Applied Engineering has always offered the largest memory for the IIe and RamWorks III continues that tradition by expanding to 1 full MEG on the main card using standard RAMs, more than most will ever need (1 meg is about 500 pages of text)...but if you do ever need more than 1 MEG, RamWorks III has the widest selection of expander cards available. Additional 512K, 2 MEG, or 16 MEG cards just snap directly onto RamWorks III by plugging into the industry's only low profile (no slot 1 interference) fully decoded memory expansion connector. You can also choose non-volatile, power independent expanders allowing permanent storage for up to 20 years.

It Even Corrects Mistakes.

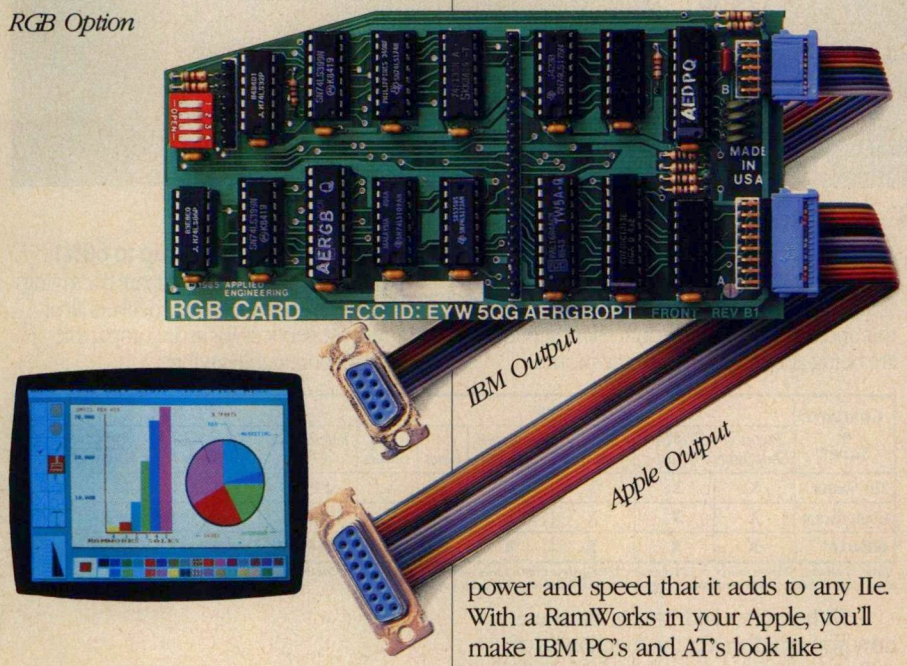
If you've got some other RAM card that's not being recognized by your programs, and you want RamWorks III, you're in luck. Because all you have to do is plug the memory chips from your current card into the expansion sockets on RamWorks to recapture most of your investment!

The Ultimate in RGB Color.

RGB color is an option on RamWorks and with good reason. Some others combine RGB color output with their memory cards, but that's unfair for those who don't need RGB *and* for those that do. Because if you don't need RGB

Applied Engineering doesn't make you buy it, but if you want RGB output you're in for a nice surprise because the RamWorks RGB option offers better color graphics plus a more readable 80 column text (that blows away any composite color monitor). For only $129 it can be added to RamWorks giving you a razor sharp, vivid brilliance that most claim is the best they have ever seen. You'll also appreciate the multiple text colors (others only have green) that come standard. But the RamWorks RGB option is more than just the ultimate in color output because unlike others, it's fully compatible with all the Apple standards for RGB output control, making it more compatible with off-the-shelf software. With its FCC certified design, you can use almost any RGB monitor because only the new RamWorks RGB option provides both Apple standard and IBM standard RGB outputs (cables included). The RGB option plugs into the back of RamWorks with no slot 1 interference and remember you can order the RGB option with your RamWorks or add it on at a later date.

RGB Option

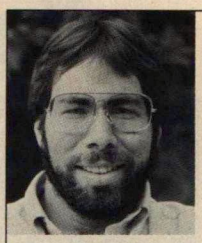


True 65C816 16 Bit Power.

RamWorks III has a built-in 65C816 CPU port for direct connection to our optional 65C816 card. The only one capable of linearly addressing more than 1 meg of memory for power applications like running the Lotus 1-2-3™ compatible program, VIP Professional. Our 65C816 card does not use another slot but replaces the 65C02 yet maintains full 8 bit compatibility.

Endorsed by the Experts.

A+ magazine said "Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks...I like the product so much that I am buying one for my own system." inCider magazine said "RamWorks is the most powerful auxiliary slot memory card available for your IIe, and I rate it four stars...For my money, Applied Engineering's RamWorks is king of the hill."



"I wanted a memory card for my Apple that was fast, easy to use, and very compatible; so I bought RamWorks."

Steve Wozniak, the creator of Apple Computer

Apple experts everywhere are impressed by RamWorks's expandability, versatility, ease of use, and the sheer power and speed that it adds to any IIe. With a RamWorks in your Apple, you'll make IBM PC's and AT's look like slowpokes.

Quality and Support of the Industry Leader

RamWorks III is from Applied Engineering, the largest, most well supported manufacturer of Apple peripherals and the inventor of large RAM cards for the Apple. With our 5 year no hassle warranty and outstanding technical support, you're assured of the most trouble free product you can buy.

It's Got It All

- 15 day money back guarantee
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- Built-in super sharp 80 column display, (U.S. Patent #4601081)
- Expandable to 1 MEG on main card
- Expandable to 16 meg with expander cards, with NO slot 1 interference
- Can use 64K or 256K RAMs
- Powerful linear addressing 16 bit coprocessor port
- Automatic AppleWorks expansion up to 3017K desktop
- Accelerates AppleWorks
- Built-in AppleWorks printer buffer
- The only large RAM card that's 100% compatible with all IIe software
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- Memory is easily partitioned allowing many programs in memory at once
- Compatible, RGB option featuring ultra high resolution color graphics and multiple text colors, with cables for both Apple and IBM type monitors
- Built-in self diagnostics software
- Lowest power consumption (U.S. Patent #4601081)
- Takes only one slot (auxiliary) even when fully expanded
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- Advanced Computer Aided Design
- Used by Apple Computer, Steve Wozniak and virtually all software companies
- Displays date and time on the AppleWorks screen with any PRO-DOS compatible clock
- Much, much more!

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RamWorks III with 512K	**$269**
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RamWorks III with 1.5 MEG	**$539**
RamWorks III with 2 to 16 MEG	**CALL**
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RGB Option	**$129**
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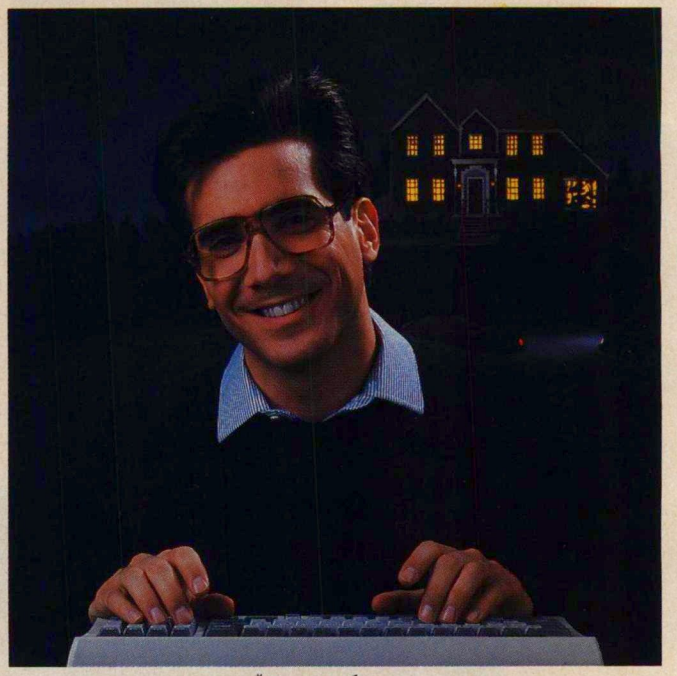

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BY LISA RALEIGH

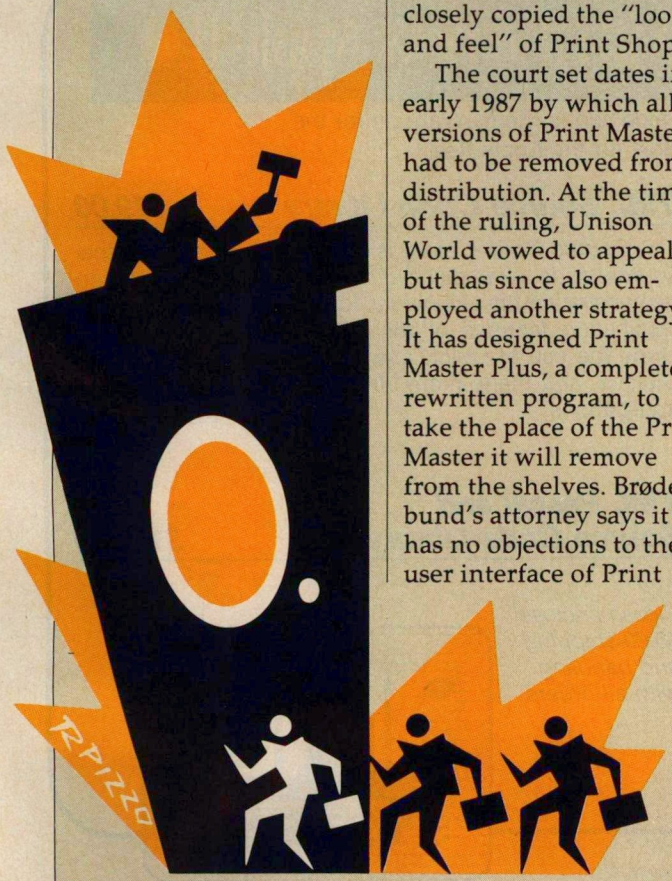
NewsPlus

Recent lawsuits by two companies are testing the scope of software copyrights

AS THE (UNISON) WORLD TURNS

Here's the latest in the Brøderbund/Unison World brouhaha: When we last left our antagonists, a judge in Northern California had ruled that Unison World's Print Master software had violated Brøderbund's copyright on the popular Print Shop program. Print Master, the court said, too closely copied the "look and feel" of Print Shop.

The court set dates in early 1987 by which all versions of Print Master had to be removed from distribution. At the time of the ruling, Unison World vowed to appeal but has since also employed another strategy. It has designed Print Master Plus, a completely rewritten program, to take the place of the Print Master it will remove from the shelves. Brøderbund's attorney says it has no objections to the user interface of Print Master Plus, nor does it have any copyright claims against this new product. At this writing, the Apple version of Print Master Plus was scheduled to be released in March, following the completion of versions for the IBM PC, Amiga, Commodore 64, and Atari. As for the legal wranglings, a trial is scheduled to begin in September to determine damages, and Unison World is proceeding with its appeal.



AS IF THE LAWYERS WEREN'T BUSY ENOUGH

Meanwhile, Lotus Development Corporation has jumped into the copyright-lawsuit fray with two suits, one against Adam Osborne's Paperback Software, which publishes a Lotus 1-2-3 clone called VP Planner, and the other against Mosaic Software, with its Lotus lookalike, Twin. Both suits charge that the products violate Lotus' copyright on 1-2-3. Lindsay Kiang, Lotus' general counsel, says that the decision to file these suits was independent of the Brøderbund/Unisor. World decision. Rather, Lotus has been analyzing its two imitators for quite some time. "Things move slowly in the corporate world. Decisions to bring lawsuits are not made lightly," Kiang says.

And what about other 1-2-3-alikes (most notably VIP Professional, a Lotus workalike for the Apple II)—will Lotus pursue them as well? VIP Technologies, maker of VIP Professional, says it hasn't heard from Lotus. Kiang says Lotus is certainly reviewing all clones that come to its attention but won't comment on the potential of further litigation. He says, though, that Lotus went after VP Planner and Twin first "because they came first to our attention."

ON-LINE ARMAGEDDON

Ready for an on-line tax-time tension reliever? Try the Fourth Annual Flying Buffalo The Day Before the Nuclear War Tournament. Run on CompuServe and based on the card games Nuclear War and Nuclear Escalation

ILLUSTRATIONS BY ROBERT PIZZO

NewsPlus

(both from Flying Buffalo), it lets you control the nuclear arsenal of a major city. The idea is to smother opposing cities with propaganda and/or warheads. Little old ladies, hippies, supergerms, and other random events keep the action light and engaging. The tournament starts April 11.

For *A+* readers only, Flying Buffalo is offering a nuclear special—both card games plus a setup in a Nuclear War game for $25, or about 30% off the list price. Be sure to mention you saw the offer in *A+*. For further information, contact Flying Buffalo, P.O. Box 1647, Scottsdale, AZ 85252; (602) 945-6917.

THE SLIGHTLY NEW APPLE II

Last month in this column, we reported on some minor changes to the Apple IIe's motherboard. Now we can tell you about some external changes as well, namely the revamped keyboard and new color of the Apple IIe. Apple made both modifications to let the IIe more closely resemble the IIGS. The new color is "platinum," a pale gray that matches the IIGS and new peripherals. The new keyboard includes a numeric keypad, just like the one built into the IIGS. Unlike the IIGS keyboard, however, this one doesn't let you plug in a mouse—that still requires a plug-in card and cable going around the back. Apple says it designed the keyboard to be functionally equivalent to the one that comes with the IIGS in order to facilitate upgrading. The IIe motherboard, you'll recall, can be swapped for a IIGS motherboard when Apple makes its $500 upgrade kits available.

THE REVAMPED APPLE IIe KEYBOARD IS THE PLATINUM GRAY OF THE IIGS AND HAS A NUMERIC KEYPAD.

Here's more you can do with the new Apple II.

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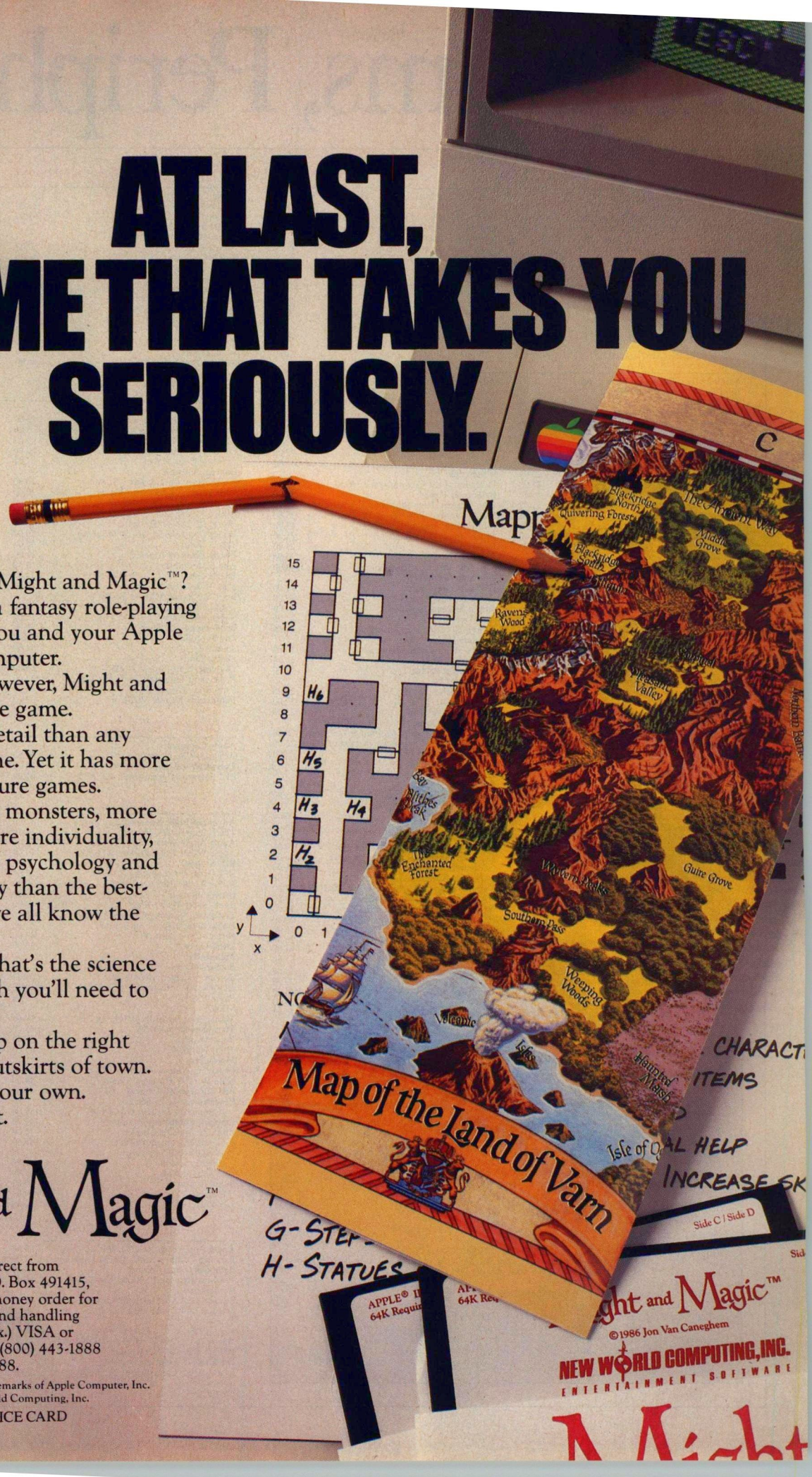

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DID YOU HEAR THE ONE ABOUT . . . ?

This story has been making the rounds at Apple: When Apple Chairman John Sculley spoke at a recent conference, he noted that Apple was using its newly purchased, multimillion-dollar Cray supercomputer to develop the latest generation of Apple computers. Another speaker at the conference was John Rollwagen, chief executive of Cray Research, Inc., who said Cray had itself recently purchased several Apple systems. In fact, said Rollwagen,

THE MULTIMILLION-DOLLAR CRAY SUPERCOMPUTER. IS AN APPLE HELPING TO DESIGN THE NEXT ONE?

when he told inventor and company founder Seymour Cray what Apple was doing with Cray's creation, Cray replied that this was quite a coincidence because he was designing the next Cray with an Apple.

SMALL DEPOSIT, NO RETURN

A Canadian software club has been offering its members the opportunity to "preview" software for $10 and asks that members then destroy the rented disks, rather than return them. Yeah, sure, says the Software Publishers Association and several software publishers who have brought suit against the Softsave Preview Club of Vancouver, British Columbia.

According to the SPA, it appears that many club members "rented" multiple copies of the same programs—hardly necessary if customers are merely trying out the software. As you might guess, many customers, in both the U.S. and Canada, appear to be paying the $10 and keeping the programs they've rented. To top it off, the club rents out unauthorized copies of products that are not accompanied by documentation, says the SPA.

Joining the SPA in the suit are Activision, Ashton-Tate, Brøderbund, Infocom, Lifetree, Lotus Development Corporation, and Microsoft Corporation. The suit charges the club with illegally reproducing copies of the plaintiffs' programs. A re-

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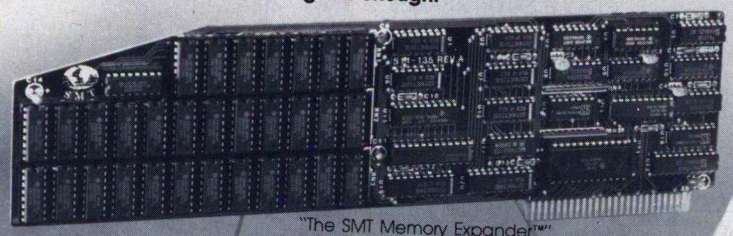

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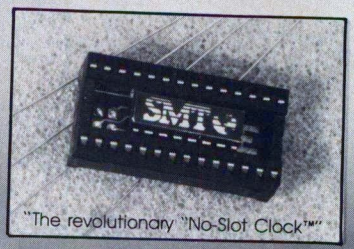

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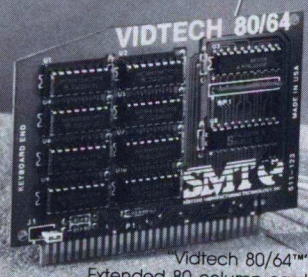

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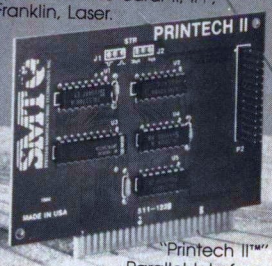

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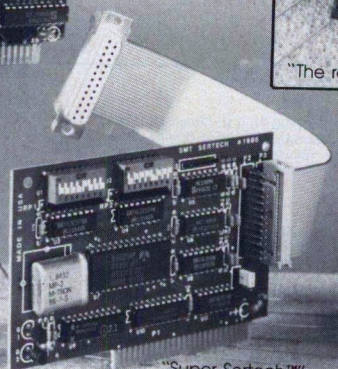

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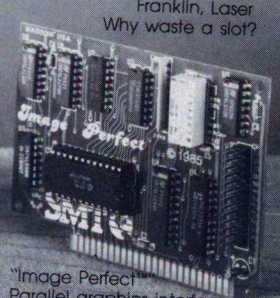

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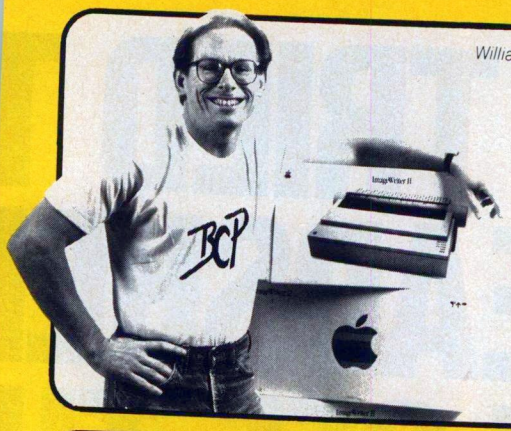

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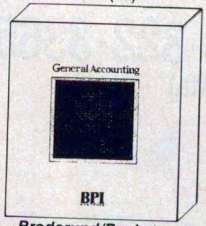

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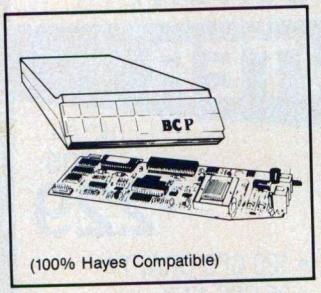

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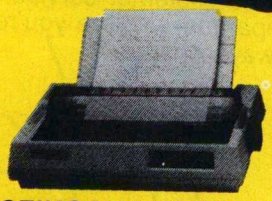
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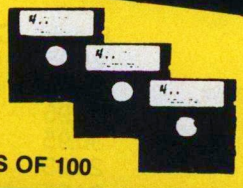
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cent raid of the club's facility rounded up evidence such as unprocessed VISA and MasterCard charge slips, many of which showed orders for hundreds of dollars. If you have an order among them, don't expect to see the software soon.

SPACE IS THE PLACE

When *A+* telecommunications columnist Russ Lockwood isn't on-line, he casts his eyes to the heavens and wishes there were more earthly sources of information about space exploration. Finding fewer and fewer publications covering the space program, he's taken desktop publishing in hand and created a newsletter called *Space Race: A Journal of Man's Achievements in Space* (12 times a year for $19). Send one dollar to receive the premier issue as a sample. You can reach Lockwood on MCI Mail at Rlockwood, on CompuServe at 73537,1075, or through the U.S. Postal Service at RD1, Box 307, Stockton, NJ 08559.

DEADLINE APPROACHING

The deadline for the fourth annual Apple Computer Clubs Merit Competition is fast approaching. Sponsored by Apple Computer, Inc.; Brown Disc Manufacturing; and Apple Computer Clubs International (ACCI), the contest lets students in three age groups show their stuff in two categories: community service and BASIC programming. Club advisers get their shot in a category entitled Computers in the Curriculum, and both students and advisers can enter projects that don't fit into other areas to be considered for Judges' Choice awards. Prizewinners (except in the Judges' Choice category) will receive trips to Washington, D.C., and the clubs with which they are affiliated will receive Apple II systems. The prizes for Judges' Choice winners will be determined by the judges. Entries must be postmarked no later than April 15, 1987. Request an official entry form from ACCI, 175 Middlesex Turnpike, Bedford, MA 01730; (800) 343-1425.

DOS BOOT GETS BOOTED

In the February installment of "NewsPlus," we reported that Orange Micro would be coming out with a product called DOS Boot, an add-on board that would allow the Apple IIGS to run MS-DOS software. Since then, Orange Micro has decided against introducing the product, citing the ever-falling prices of the low-cost IBM-compatibles. "With all the competition from clones coming in, it just wasn't a practical project to go ahead with," said Howard N. Rosenman, Orange Micro's marketing manager. +

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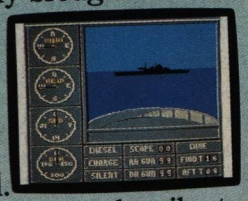

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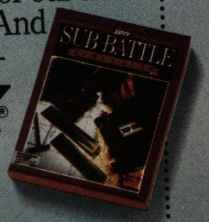

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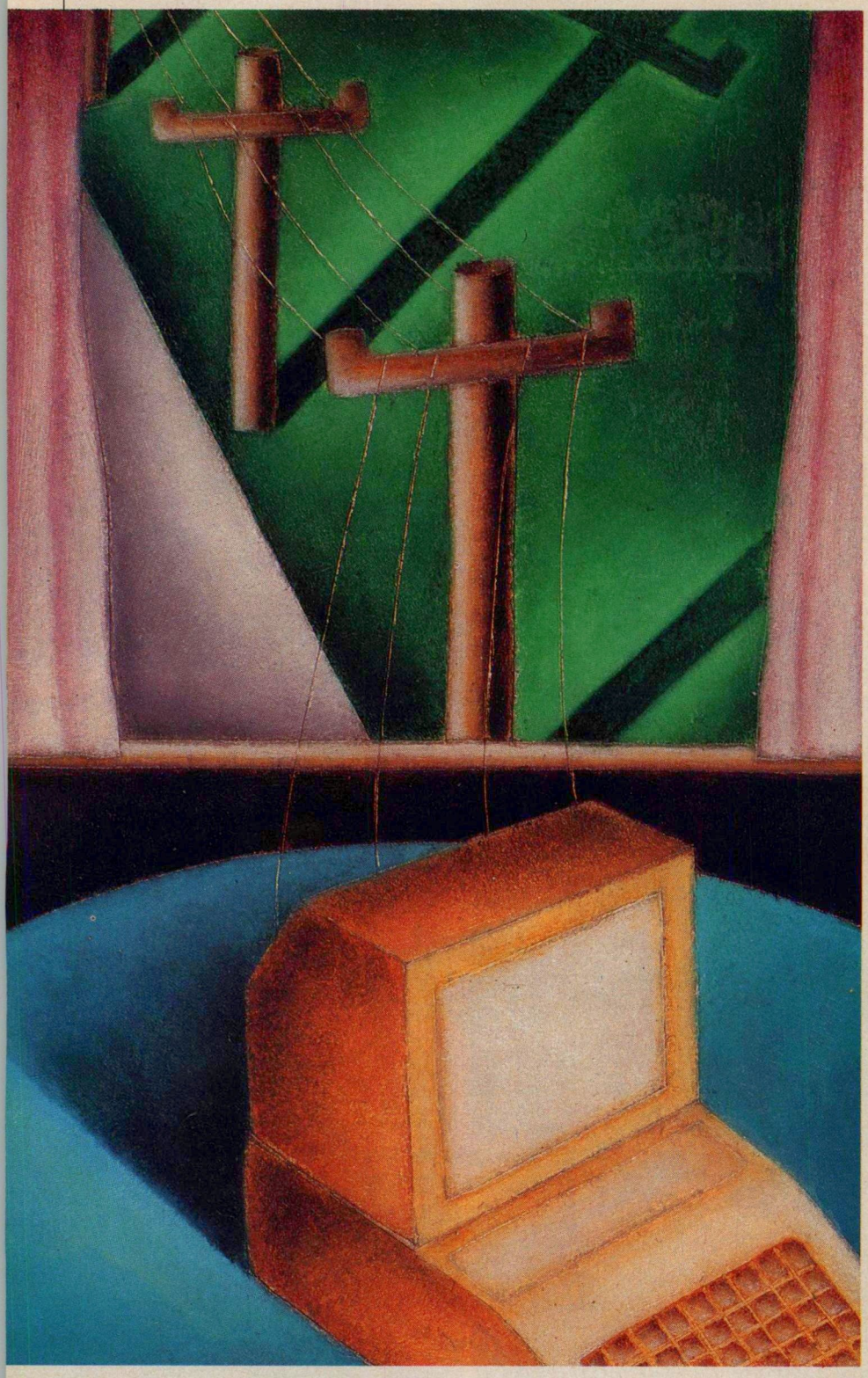

In 1980 I bought a 300-bit-per-second modem for my Apple II for almost $500. Today, I can buy a similar modem for less than $100 or move up to a faster 1200-bps modem for less than $200. The newer 2400-bps modems are still fairly expensive—most fall into the $350–$600 range—but prices will undoubtedly drop as competition among the many modem manufacturers heats up.

The low prices should be reason enough to convince you to buy a modem, at least if you haven't already invested in one. If you need more prodding, keep in mind that many of the newer modems have several advanced features that make them more powerful, easier to use, and easier to test than their predecessors were. Performance diagnostics, help screens, call-progress detection (the ability to detect dial tones and busy signals), automatic redialing, adaptive dialing (switching automatically to pulse dialing if tone dialing is not available), internal phone-number directories, and automatic error detection and correction are quickly becoming standard features.

In this article, I'll explain the choices available to you if you want to buy a modem for your Apple II, and I'll highlight some of the important features to look for and some of the abilities you should insist on.

MODEM TYPES

Both internal and external modems work with Apple II-series computers. An internal modem plugs into an expansion slot, slot 2 by convention. (These types of modems obviously don't work with the slotless IIc.) An external modem is one you can connect to any computer that has a serial-interface port. You can add such an interface to an Apple II-series computer by placing a card in a peripheral slot. The IIc and IIGS come with two built-in serial ports.

ILLUSTRATION BY LISA DESIMINI

A Hardware Buyer's Guide

Important tips for modem shoppers and a comprehensive product chart

You should consider three primary factors when deciding whether to purchase an internal or an external modem:

- **Price.** An internal modem is usually less expensive than an external modem because no separate serial-interface card—and no cable between the card and the modem—is necessary.
- **Ease of Installation.** An internal modem is simple to install—just plug it into a slot, connect one end of a telephone cord to a jack on the modem card and the other to a telephone wall jack, and you're done. Installing an external modem is more complex, mainly because you have to install a cable between the connectors on the modem and the serial-interface card. Designing such a cable is no simple task, even for experienced computer users, because of the multitude of different pin connectors that manufacturers of serial-interface cards and modems use.
- **Portability.** Internal modems that work with Apple II-series computers work only with Apple II-series computers, since the modems are designed specifically to mate with the Apple's unique slot connector. External modems work with any computer with a serial-interface port, regardless of brand. If you are considering buying a second computer, you may want to buy an external modem so that both your systems can share it.

Keep in mind that the specific modem you choose must be compatible with the modem used by the computer with which you plan to communicate. In most cases, this limitation means only that your modem must operate at the same transmission rate as that of the other modem and that it must use the same method for data modulation.

If possible, you should avail yourself of a minimum modem speed of 1200 bps, since 300 bps can be frustratingly slow once you've had a taste of greater speed. And these days, 1200 bps is so inexpensive that it's quite affordable. Still, an under-$100 300-bps modem may be adequate if you just want to do on-line conferencing. If you want to, say, pull IIGS picture files or other large documents off CompuServe, however, you'll want to go to 1200 or 2400 bps to save yourself time.

As far as data modulation is concerned, the majority of modems you're likely to encounter (in North America, at least) employ the same modulation methods: "Bell 103" for 300-bps communication, "Bell 212A" for 1200-bps communication, and "CCITT v.22 bis" for 2400-bps communication. Other standards do exist, though, so be careful.

INTERNAL MODEMS

Hayes Microcomputer Products introduced the Apple world to internal modems for the first time when it released its Micromodem in 1979. Three popular Micromodem-compatible internal modems are the MultiTech MultiModem IIe, the Zoom Telephonics Zoom/Modem IIe, and the Transend AMC-300.

The Micromodem operates at either 300 or 110 bps and can dial, answer, and hang up the telephone under program control. The introduction of the Micromodem marked the beginning of a new era for Apple II telecommunications. Before the Micromodem, modem operation was awkward, since you had to use an acoustic coupler that couldn't automatically dial, answer, or activate a carrier signal.

Novation's Apple-Cat II is the other major 300-bps internal modem. It is not software-compatible with the Micromodem, so its sales have suffered, since few independently developed programs work with its unique design. Don't buy an Apple-Cat until you verify that the communications software you want to use works properly with it.

The Apple-Cat is actually more than just a modem. Optional attachments allow it to detect Touch-Tone

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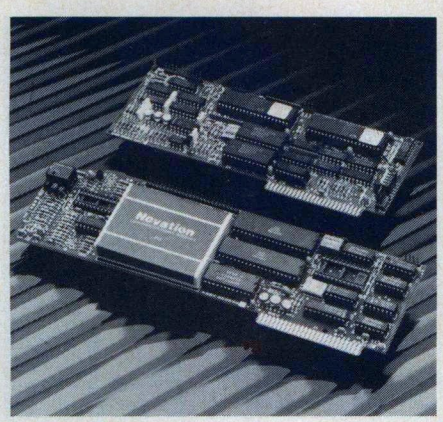
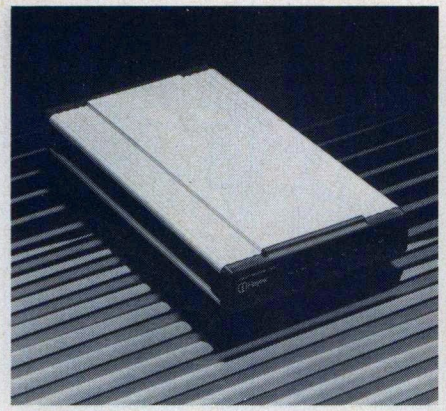


Apple-Cat II from Novation



The Hayes Smartmodem 2400

The Hayes Smartmodem 1200A

signals sent to it over the telephone line or to control BSR wall-switch, lamp, and appliance modules. BSR modules, which you can get at Radio Shack or electronics departments in stores such as Sears, react to commands, sent along ordinary house wiring, to turn lights or heavy-duty appliances on or off that are plugged into the modules.

1200-bps Internal Modems

One other option for the Apple-Cat is the 212 Upgrade, a Bell 212A-compatible 1200-bps modem on a card that connects to the standard Apple-Cat through a ribbon cable. You can put it into a vacant slot or on top of the power supply. Software for it is limited, unfortunately.

Another 1200-bps internal modem for the Apple is the Prometheus ProModem 1200A. Initially released as a two-card device, it was later redesigned to fit on a single card. The ProModem 1200A emulates the features of two standard peripherals I'll discuss below, the Apple Super Serial Card and the Hayes Smartmodem, which means that it works properly with most of the communications programs.

The ProModem has the most elaborate firmware of any internal Apple modem. It not only handles the standard dialing and answering chores but also offers such advanced features as automatic file transfer and simultaneous on-line printing with certain printers.

Other 1200-bps internal modems that are available for the Apple II include the new, and expensive, Hayes Smartmodem 1200A; the equally new Datalink modem from Applied Engineering; and the inexpensive Cermetek AppleMate 1200. All these modems emulate the Super Serial/Smartmodem combination that is described below.

EXTERNAL MODEMS

As I noted above, external modems are more difficult to install than are internal modems. Nevertheless, external modems are becoming increasingly popular because of their portability and because they can respond to sophisticated commands that simplify communicating with a remote computer.

If you are using an Apple IIc, you must use an external modem because the IIc has no slots, only two built-in serial ports. You will probably want to use an external modem with the IIGS as well, because it also has built-in serial ports. Since the GS also has slots, however, you can use an internal modem if you want to. See "Using Modems with the Apple IIGS," which accompanies this article, for information on how to configure a IIGS for internal and external modems.

One external modem, the Prometheus ProModem 300c, is specifically designed for the IIc. It is very small and attaches directly to serial port 2 without a cable.

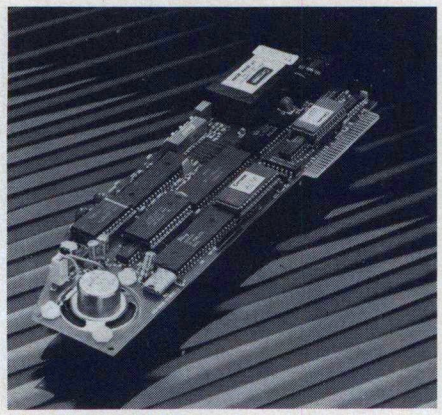
Super Serial Card

A serial-interface card serves as the communications link between the Apple and an external modem. The standard serial-interface card is the Apple Super Serial Card (SSC). Its built-in firmware includes a communications mode that is ideal for

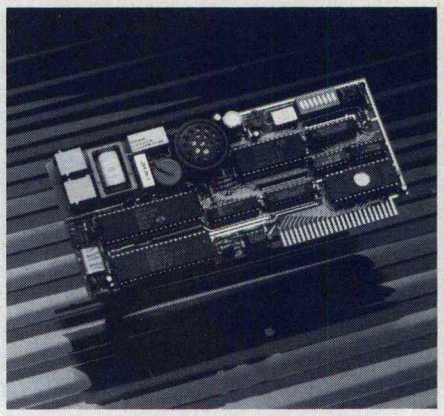
Using Modems with the Apple IIGS

You must use the IIGS control panel slots command to tell the IIGS whether your modem interface is a card in a slot or a built-in port. To enter the control panel, turn on the GS and bring up the Desk Accessories menu by pressing Control/open-apple/Escape. Select the control panel item from that menu, then Slots from the control panel menu. Next, go to the entry for your slot (usually 2) and use the right-arrow key to change the designation to Your Card (if you're using a plug-in card) or to Modem Port (if you're using the built-in port). Finally, return to the control panel menu by pressing Escape, choose Quit, and then choose Quit from the Desk Accessories menu. The new setting takes effect the next time you reboot the IIGS.

Depending on the cable you're using between the GS modem port and your modem, you may need to use the control panel Modem Port command to change the settings of two mysterious parameters, DCD Handshake and DSR/DTR Handshake. The default values of both parameters are Yes, but you will have to change them to No if your program seems to freeze when the modem is turned off or when you aren't connected to a remote computer. You should also make sure that a third parameter, XON/XOFF Handshake, is set to No (its default).



AppleMate 1200 from Cermetek



Datalink from Applied Engineering

The Prometheus ProModem 300c

interacting with other computers through a modem. Compatible cards are the Street BusinessCard, CCS Model 7711, and the Videx PSIO.

One important point to note about the SSC is that you don't have to change switch settings on the card to change the transmission rate; you can do so under program control—an important factor if you're dealing with several remote systems that operate at different transmission rates.

Changing the transmission rates of some serial-interface cards, notably the CCS Model 7710, the AST Multi-I/O card, and the Prometheus VersaCard, requires switch setting. You should use these cards with modems only if you're always going to communicate at the same rate.

Hayes Smartmodem

If you buy an external modem for the Apple II, it will almost certainly be an intelligent modem such as the Hayes Smartmodem or its dozens (and dozens) of imitators, including the Apple Personal Modem (Apple's modem is very small and attaches to an electrical outlet, so it's off your desk and out of the way). An intelligent modem has a built-in microprocessor that runs a control program in its own internal ROM. This program understands a set of commands that control various communications chores such as dialing and answering; these commands go to it through the serial interface to which the modem is connected.

Once you've properly configured an intelligent modem, you can easily start a communications session by sending the modem's dialing command. The modem electronically picks up the telephone, dials the specified telephone number, waits for an answer tone from the remote computer, and then turns on its originate tone so that you can start communicating. All these steps occur automatically without manual intervention. If the modem doesn't detect an answer tone within a prescribed period of time, an appropriate result code appears, and the modem hangs up the telephone.

Hayes Compatibility

The Hayes Smartmodem has become the standard for intelligent external modems. That is, virtually all intelligent modems use the same set of commands and result codes the Smartmodem uses—manufacturers of such modems call them Hayes-compatible or AT-compatible (AT is the attention-code prefix that precedes all Smartmodem commands). This label does not make reference to Micromodem compatibility—the older Micromodem is quite different from the Smartmodem.

Despite claims of AT compatibility, some modems are not truly compatible; look out for them because they may not work with standard communications programs. The Avatex 1200 (but not the Avatex 1200hc), for example, uses only a small subset of the AT command set. Others do not handle the S commands (for setting parameters and internal registers) in the same way.

Many modems have command sets that are supersets of the Smartmodem commands, however. The

Free Hayes Command-Set Poster

When Hayes started building modems in 1978, it wanted a simple way to control its intelligent modems and developed the Hayes Standard AT Command Set. The complete set of instructions controls the speeds and capabilities of the company's modems. Through the years, Hayes has carefully expanded the command set, which has become the standard for telecommunications software on Apple computers. In fact, most modem manufacturers make a point of claiming that their modems work with the Hayes Standard AT Command Set. Some are actually compatible, and others are not. Unfortunately, we were not able to test every modem in the modem chart in this issue for Hayes compatibility. One thing is certain: To obtain true Hayes compatibility, you must go to the source—Hayes.

Hayes is offering a poster that clearly displays the complete Standard AT Command Set for intelligent modems. The poster includes a command summary, configuration settings, S-register summary, and result-code summary for the entire line of Smartmodems.

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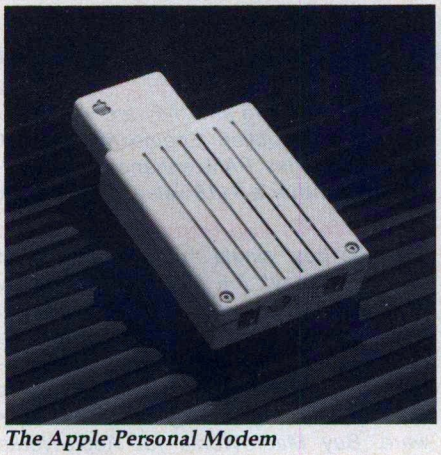
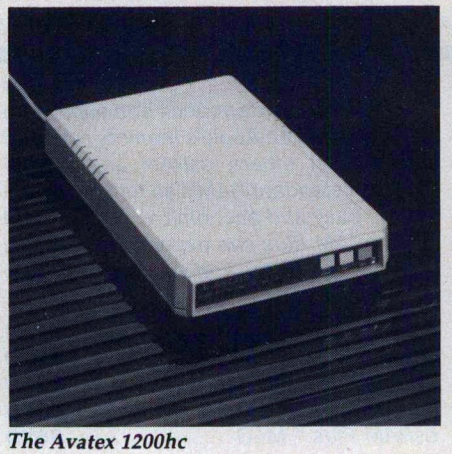
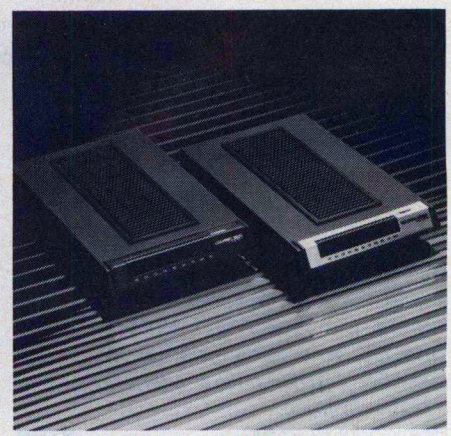


The Apple Personal Modem



The Avatex 1200hc



The Courier 1200 and 2400e

extra commands let you store telephone numbers in an internal directory, set the error-checking protocol, have help screens displayed, and so on. Unfortunately, the array of extra commands is not standard, so we're stuck with a myriad of schemes. Fortunately, these extra commands are rarely used and aren't critical to the proper operation of most communications software.

Hayes-compatible modems also have some hardware differences, improvements such as built-in MNP error detection and correction (the Courier 2400e, Racal-Vadic 2400VP, Signalman Lightning 24, and Multi-Tech MultiModem 224E have this feature), adaptive dialing, busy-signal detection, testing circuitry, and so on. You can program Okidata's Okitel 1200 with a delay that bypasses interruptions (such as call waiting signals) to maintain the phone connection. One intelligent modem, the Cermetek security modem, is unique in that it can keep track of several identification codes and passwords and does not permit access by unauthorized users.

When buying an external modem, you should definitely insist on one that is Hayes-compatible. You should also try to buy one with the highest transmission rate you can afford. Then shop around for the frills, extra features that make the modem a little more exciting than a plain-vanilla Smartmodem.

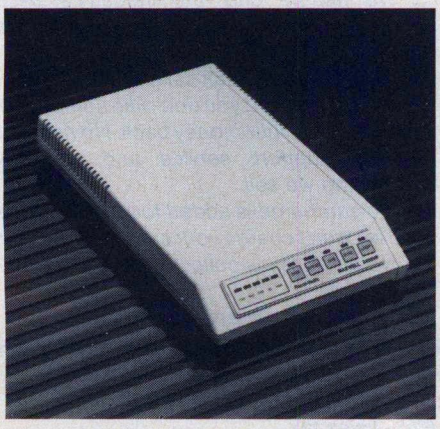
Dialing Features

There are two methods for dialing a telephone. You find the older method, called pulse dialing, on rotary-dial telephones. The newer method, called Dual Tone Multi-Frequency (DTMF) dialing, is the one on Touch-Tone telephones. The main advantage of using the DTMF dialing method rather than pulse dialing is that you can dial numbers much more quickly. Unfortunately, not all telephone exchanges can handle DTMF dialing yet.

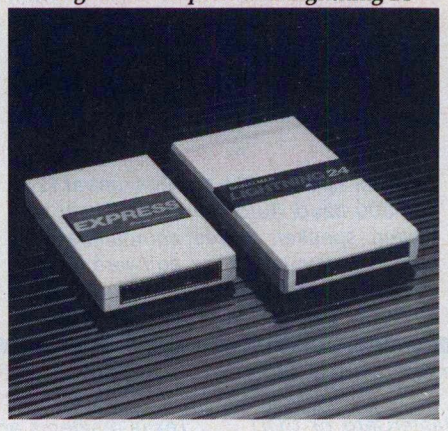
All Hayes-compatible modems are capable of both pulse and DTMF dialing. Look for modems (such as the Prometheus ProModem) that adaptively dial the phone. That is, they use DTMF dialing if your telephone exchange handles it and the pulse method otherwise. The modem determines whether DTMF dialing will work or not by tone-dialing the first digit in the number and seeing if the dial tone disappears; if it doesn't, the telephone exchange ignores the number, so it must require pulse dialing.

Other convenient dialing features to look for are commands to repeat the last dialing command, or an automatic redial feature. Some modems (Practical Modem 1200SA, Racal-Vadic 2400VP, Courier 2400e) have an internal memory area in

The Racal-Vadic 2400VP



The Signalman Express and Lightning 24



Okidata's Okitel 1200

Why Are Apple Owners So Loyal?

People who have the best often are, but in the case of Apple there's more. Apple owners think back to how Apple got started in 1977, just two people working out of a garage and what happened is the talk of Wall Street and the computer industry as well. Many like the fact that Apple only makes computers. Unlike their competition they don't make typewriters, copiers or telephones. They do just one thing and that's one reason they do it so well.

At Applied Engineering we think the same way. You see, Applied Engineering is the only major hardware manufacturer totally dedicated to the Apple computer. Whereas most of our competitors must divide their customer support and engineering time between IBM, Atari, Radio Shack or other computers, our engineers only design products for the Apple. This dedication allows us to be much more familiar with the Apple and the people who use them.

We don't expect you to buy an Applied Engineering peripheral on loyalty alone, but when you compare our products to those made by QUADRAM, MICROSOFT, AST and others you'll find out why Applied Engineering means a quality design, innovation, craftsmanship and total Apple compatibility.

The other guys do pretty well considering how busy they are with IBM. But at Applied Engineering, ALL of our work involves the Apple. In fact, all of our employees were Apple owners before they came to work for us. The people in shipping, engineering, quality control, order entry, all use Apples at work and at home.

This one-track mindedness of ours allows us to offer the largest storage with AppleWorks and most other programs and our Z-80 card includes the new 5.1 operating system. We can expand the Apple II to over 8 MEGABYTES of memory and we've got clock cards, accelerator cards, music cards, A to D converters, digital controllers, and a BSR system so your Apple can control your whole house with no additional wiring!

Applied Engineering recognizes that we've got to do a better job than our IBM counterparts because we know you're smarter than the average computer buyer, you bought an Apple. You see, our competition has it a little easier, their customers aren't as smart as you. After all, they bought the wrong computer.

So if you need more memory, or want your Apple to run faster, or have 80 columns, or RGB color, double hi res graphics, if you want to know the time and temperature or other "real world" conditions, if you'd like to run CP/M software, have a RAM disk, increase the storage of AppleWorks and other programs, if you want your Apple to play music, talk and sing, if you'd like your Apple to control the lights and appliances in your house, then do what NASA does, what Ford does, what the U.S. Government, Hughes Aircraft, Honeywell, Westinghouse, AT&T, Apple Computer, and even what Steve Wozniak does, call Applied Engineering. Then you will discover what thousands of companies and over a hundred thousand Apple owners already know, that you can be smart and loyal all at the same time.

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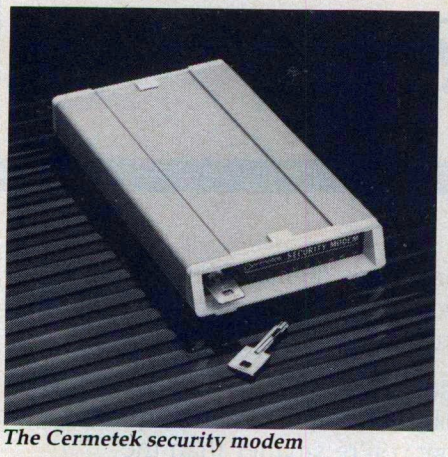
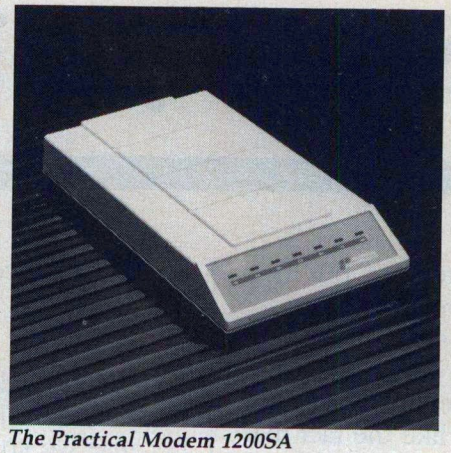
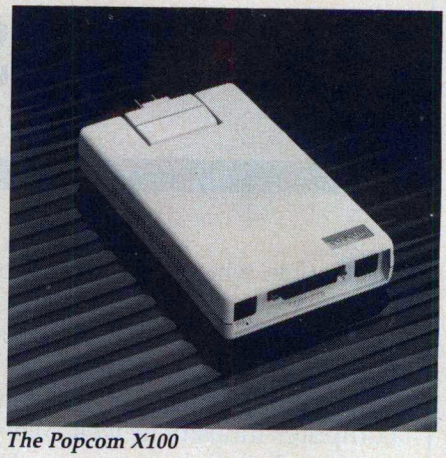


The Cermetek security modem



The Practical Modem 1200SA



The Popcom X100

which you can store frequently called telephone numbers.

Dial-Tone/Busy-Signal Detection

Many modems, such as the Popcom X100 and the Prometheus Promodem series, can now detect the presence of a dial tone or a busy signal on the telephone line. This ability improves dialing procedures, since dialing cannot begin until a dial tone is active; if the modem detects a busy signal, it can hang up the telephone right away. Software you use with a modem that can't detect a busy signal simply waits a predetermined length of time (30 seconds or so) for a carrier signal to appear before hanging up the phone.

Modems that don't have a dial-tone-detection feature use a technique called blind dialing to make a call. They first "pick up" the telephone, wait a fixed period of time—usually about three seconds—and then begin dialing. The three-second delay is usually enough for the dial tone to kick in; if it's not, the call will not go through as expected.

Indicator Lights

Many external modems use indicator lights to reflect the state of the communications line, which simplifies determining whether the modem is working properly. The front panel of the Hayes Smartmodem 300 has seven lights, letting you monitor the status of Auto Answer, Carrier Detect, Off Hook, Receiving Data, Sending Data, Terminal Ready, and Modem Ready.

Having indicator lights on a modem is convenient because it makes troubleshooting easy. Consider a situation in which a remote computer is not responding to any of the commands you've entered from your Apple's keyboard because the transmit wire in the modem cable is damaged. Without indicator lights, you would be hard-pressed to determine the reason for this lack of activity; it could be caused by a faulty transmit or receive line, a loss of carrier, and so on. With indicator lights, however, you will spot the problem right away because the "received data" light will not come on.

Speaker

Another desirable feature in a modem is a speaker. With a speaker, you can easily monitor the status of a call to determine whether the call was successful or, if not, why not. For example, suppose you dial the wrong number with an auto-dial modem. If you don't have a speaker, you may never know that the reason you didn't get an answer tone was because you weren't calling a computer. With a speaker, you would hear the cries of "Hello! Hello!" and quickly realize your error.

The advantages of having a speaker would quickly disappear if it were always on and you had to listen to the high-pitched squeals of modulated data and carrier signals throughout your communications session. Fortunately, all modem speakers can be turned on and off under software control—most software turns on the speaker while dialing and turns it off as soon as the modem detects a carrier signal. You can manually adjust the speaker volume on some external modems.

DCD Control

Most communications programs check the state of the DCD ("data carrier detect") line between the modem and the computer to determine if a connection has been established with another computer. If there is no carrier, the program will give you a Hung Up message at the appropriate time, ask you to specify a telephone number when you try to enter the Communications mode, and will know when a caller has connected in the Answer mode.

Most modems generate a "fake" DCD signal to indicate that a carrier signal is always active, however. They do so because some computers can't send commands to an intelligent modem unless the DCD is active. With a fake DCD signal, a program cannot tell you when the telephone connection with the other computer has been disconnected, so your program won't behave as intelligently as if the DCD line reflected the true state of the carrier signal.

Some modems have a switch you can use to enable or disable the fake DCD signal. You may want to buy a modem with such a switch to give yourself maximum flexibility. If you're going to operate a bulletin-board system, you will want this switch so you can tell when incoming callers have disconnected.

Special Equipment

Modems are not the only way of transmitting data from A to B. Pacific Bell has been experimenting with

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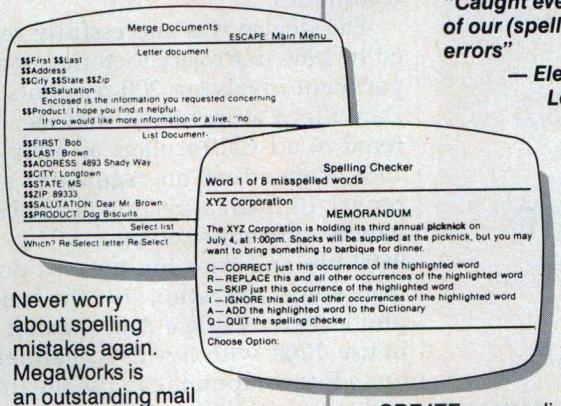

"Caught every one of our (spelling) errors"
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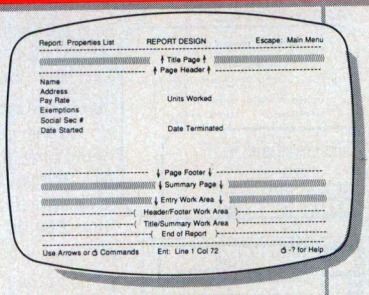
ReportWorks $49.95



"ReportWorks is the most important AppleWorks add-on available." — A+

Making decisions is easy with the right information. ReportWorks adds powerful new report generation capabilities to AppleWorks, creating reports, tables, lists and full-page forms from existing AppleWorks database and spreadsheet files. It performs all calculations, such as adding taxes, adjusting discounts, looking up prices and totaling invoices. And, it provides the ability to repeatedly sort, search and select the information to be included in the report.

- ▲ POWERFUL free-form design features for creating reports and forms.
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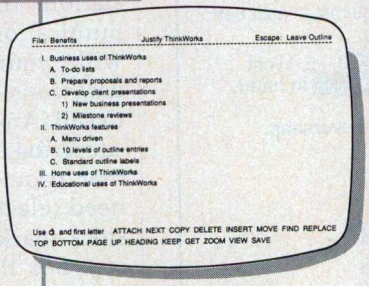
- ▲ MORE math functions than Apple Works alone.
- ▲ ADDITION of headers, footers, title & summary pages, etc.

System Requirements: Apple IIe (enhanced), IIc (128K min), IIgs; Two disk drives recommended for ReportWorks and ThinkWorks; Optional: most hard disks, RAM cards, UniDisk 3.5

ThinkWorks $49.95

"A well-made outline processor. . ." ***— A+***



Good planning means success, so ThinkWorks is a must for those reaching for the top. This easy-to-use outlining tool enables you to efficiently organize nearly any type of information — for business, home or school. Outlines can be expanded, rearranged, and merged with familiar AppleWorks commands. Use it by itself or as a powerful add-on tool.

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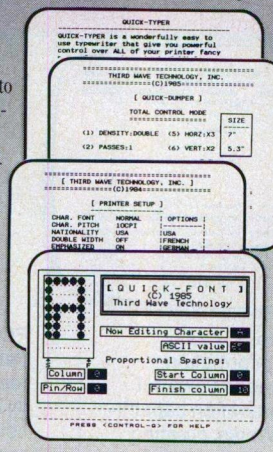

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ONLINE

a multiplexer device that can transmit over five data channels and two voice channels simultaneously. These are digital channels that are routed to another multiplexer at the phone company's central office. From there they are routed to a destination selected by the user (e.g., to CompuServe or to Aunt Millie in Toronto) using more traditional techniques.

The device was successfully tested in 1986 in Project Victoria, an experiment involving 200 residents of Danville, California. It may be offered to all Californians as early as 1988, depending on regulatory approval. Its main attraction is that can handle transmission rates of up to 9600 bps and does not prevent normal voice operation of the telephone, even while a data channel is in use. Plus, with five data channels, up to five computers can use the line at the same time.

Only time will tell whether the Project Victoria technology will become a widespread standard. Detractors say it is incompatible with the international standard for digital telephone equipment, the integrated services digital network (ISDN) standards.

Putting It Together

Buying a modem (and, if necessary, a serial-interface card and cable) is only the first step in transforming your Apple II into a personal telecommunications workstation. You still need a good communications program that works with your modem and facilitates data transfers with systems you want to call. And, of course, you'll have to subscribe to the information utilities that provide the services that you need (electronic mail, conferencing, stock-market data retrieval, and so on). See the accompanying articles in this issue for detailed analyses of these two important topics. +

Gary Little developed Point-to-Point, a communications program for the IIe, IIc, and IIGS published by Pinpoint. He also designed the Binary II file format, which allows the transfer of any ProDOS file to and from information services and bulletin boards.

ONLINE

Modem Chart

A selection of internal and external modems with their specifications

Internal Modems

	APPLIED ENGINEERING DataLink	CERMETEK MICROELECTRONICS AppleMate 1200	HAYES MICROCOMPUTER PRODUCTS INC. Smartmodem 1200A	NOVATION Apple-Cat	PRACTICAL PERIPHERALS Practical Modem 1200 II	PROMETHEUS PRODUCTS Promodem 1200A-2	TRANSEND CORP. Apple Modem Card 300	ZOOM TELEPHONICS Zoom Modem IIe	Zoom IIe Plus	Networker
Price	$199	$295	$439	$319	$199	$295	$79	$79	$99	$59
Warranty period (in years)	5	1	2	1	5	2	90 DAYS	2	2	2
Software included	YES	NO	NO	YES	YES	YES	NO	YES	YES	YES
Max. transmission rate (bps)	1200	1200	1200	300[10]	1200	1200	300	300	300	300
Number of phone jacks	2	1	2	2	2	2	1	2	2	2
SYSTEM										
II Plus	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
IIe	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
IIGS	YES	YES	YES	NO	YES	YES	YES	YES	YES	NO
DIALING & ANSWERING										
Auto-dial	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Auto-redial	YES	NO	YES	YES	YES	YES	NO	NO	NO	NO
Auto-answer	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Call-progress reporting:										
Detects dial tone	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO
Detects busy signal	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO
Detects no answer	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO
Waits for silence	YES	YES	YES	YES	YES	YES	NO	YES	NO	NO
Waits for second dial tone	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO
Waits for carrier	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Adaptive dialing	YES	YES	NO	NO[1]	YES	YES	YES	YES	YES	NO
Stores phone numbers	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO
Battery backup	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO
Automatically hangs up phone	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
OTHER FEATURES										
Hardware error correction	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO
Built-in help screens	YES	NO	NO	YES	YES	YES	NO	NO	NO	NO
Complete AT-compatible command set	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO
Speaker volume manual	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO
Speaker volume software	NO	NO	YES	YES	YES	NO	NO	YES	YES	NO
DCD switch	YES	YES	YES	NO[1]	YES	YES	YES	NO	NO	NO
DTR switch	NO	NO	YES	NO[1]	YES	YES	YES	NO	NO	NO
DIAGNOSTICS										
Compute ROM Checksum	YES	NO	YES	NO	YES	YES	NO	NO	NO	NO
Self-test	YES	NO	YES	YES	YES	YES	NO	NO	NO	NO
Test internal memory	NO	NO	YES	YES	YES	NO	NO	NO	NO	NO
Analog loopback test	YES	NO	YES	YES	YES	YES	NO	NO	NO	NO
Digital loopback test	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO
Remote digital loopback test	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO

1. Available through software **2.** MNP option, $100 **3.** Has indicator light, however **4.** Available on model 224ARQ, $935 **5.** Firmware controlled **6.** 1450 bps and 2400 bps when communicating with other Microcom modems **7.** 2900 bps and 4800 bps when communicating with other Microcom modems **8.** MNP option, $50 **9.** Available on Multi-Modem 224e, $649 **10.** Optional 1200 bps upgrade card, $229.95 **11.** With MNP, $795 **12.** Purchase with or without **13.** With MNP, $845 **14.** Optional buffer, $149 **15.** LCD indicator **16.** Second year, $15 **17.** 2400G: 2400 bps

This chart contains a sampling of products, and the information herein is based on manufacturers' claims.

Stand-Alone Modems

	ANCHOR AUTOMATION Volksmodem	Signalman Express	Signalman Lightning 24	Secure Modem	APPLE COMPUTER, INC. Personal Modem	AST RESEARCH AST-1200	AST-2400	BYTCOM Bytcom 24/12	COMPUTER FRIENDS Mercury	CONCORD DATA SYSTEMS INC. CDS 212AD	CDS 224
Price	$199	$399	$499	$599	$399	$499	$699	$390	$149	$350	$450
Warranty period (in years)	5	5	5	5	90 DAYS	2	2	2	2	2	2
Software included	NO	NO	NO	NO	NO	YES	YES	NO	NO	YES	YES
Max transmission rate (bps)	1200	1200	2400	2400	1200	1200	2400	2400	1200	1200	2400
Number of phone jacks	2	2	2	2	2	2	2	2	1	2	2
INDICATOR LIGHTS											
Auto answer	NO	YES	YES	YES	NO	YES	YES	NO	YES	YES	YES
Carrier detect	NO	YES	YES	YES	NO	YES	YES	YES	YES	NO	YES
Off hook	NO	YES	YES	YES	NO	YES	YES	YES	YES	NO	YES
Receiving data	NO	YES	YES	YES	NO	YES	YES	NO	YES	YES	YES
Sending data	NO	YES	YES	YES	NO	YES	YES	NO	YES	YES	YES
Terminal ready	NO	YES	YES	YES	NO	YES	YES	NO	YES	YES	YES
High-speed indicator	NO	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO
DIALING & ANSWERING											
Auto-dial	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Auto-redial	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Auto-answer	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Call-progress reporting:											
Detects dial tone	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	NO
Detects busy signal	YES	YES	YES	YES	YES	NO	YES	YES	NO	YES	NO
Detects no answer	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Waits for silence	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Waits for second dial tone	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	NO
Waits for carrier	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Adaptive dialing	YES	YES	YES	YES	YES	NO[1]	NO[1]	YES	YES	YES	YES
Stores phone numbers	NO	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO
Battery backup	NO	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO
Automatically hangs up phone	NO	YES	YES	YES	NO	YES	NO	YES	YES	YES	YES
OTHER FEATURES											
Hardware error correction	NO	NO	YES[2]	NO	NO	NO	NO	YES	NO	NO	NO
Built-in help screens	YES	YES	YES	YES	NO	YES	NO	YES	NO	NO	NO
Complete AT-compatible command set	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Speaker volume manual	NO	YES	YES	YES	YES	NO	NO	NO	YES	YES	NO
Speaker volume software	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO
DCD switch	YES	YES	YES	YES	NO	NO[3]	NO[3]	NO[3]	YES	NO[1]	NO
DTR switch	YES	YES	YES	YES	NO	NO[3]	NO[3]	NO[3]	YES	NO[1]	NO
DIAGNOSTICS											
Compute ROM Checksum	NO	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO
Self-test	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Test internal memory	NO	YES	YES	YES	NO	NO	YES	YES	NO	NO	NO
Analog loopback test	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES
Digital loopback test	NO	YES	YES	YES	NO	YES	YES	YES	YES	NO	YES
Remote digital loopback test	NO	YES	YES	YES	YES	NO	YES	YES	YES	NO	YES

1. Available through software **2.** MNP option, $100 **3.** Has indicator light, however **4.** Available on model 224ARQ, $935 **5.** Firmware controlled **6.** 1450 bps and 2400 bps when communicating with other Microcom modems **7.** 2900 bps and 4800 bps when communicating with other Microcom modems **8.** MNP option, $50

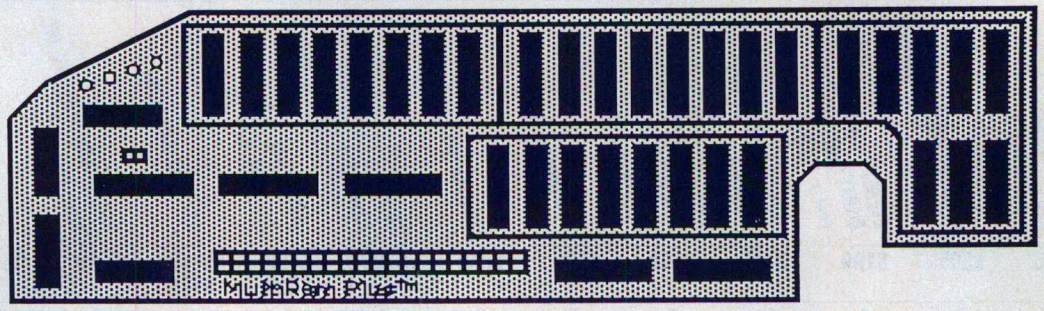
ONLINE

CONCORD DATA SYSTEMS INC. CDS 224AD	CTS DATACOMM CTS 212 AHC	CTS 2424 ADH	EVERETT/CHARLES MARKETING Avatex 1200HC	FASTCOMM DATA CORP. Fastcomm 2495	HAYES MICROCOMPUTER PRODUCTS INC. Smartmodem 300	Smartmodem 1200	Smartmodem 2400	INTEC Intec 1200	MICROCOM, INC. AX/1200, AX/1200c	AX/2400, AX/2400c	MULTI-TECH SYSTEMS, INC. Multi-Modem	Multi-Modem 224
$495	$295	$395	$199	$999	$199	$599	$899	$100	$499 $599	$749 $899	$399	$599
2	2	2	2	2	2	2	2	2	1	1	2	2
YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
2400	1200	2400	1200	9600	300	1200	2400	1200	1200[6]	2400[7]	1200	2400
2	2	2	1	1	2	2	2	1	2	2	2	2
YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES	NO	NO
YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
NO	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES	YES
YES	YES	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES	YES
YES	YES	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES	YES
YES	NO	NO	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES
YES	NO	NO	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	NO	NO	NO	YES	YES	YES	YES	YES
NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	YES	NO	NO
NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	YES	NO	NO
NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
NO[4]	NO	NO[2]	NO	YES	NO	NO	NO	NO	YES	YES	YES[8]	YES[9]
YES	YES	YES	YES	YES	NO	NO	NO	NO	YES	YES	YES	YES
NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
NO	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES
NO	NO	YES	NO	NO	NO	YES	YES	NO	YES	YES	NO	NO
NO	NO	NO	YES	YES[5]	NO	YES	NO[1]	YES	NO	NO	YES	YES
NO	NO	NO	YES	YES[5]	YES	YES	NO[1]	YES	NO	NO	YES	YES
NO	YES	YES	NO	NO	YES	YES	YES	NO	YES	YES	NO	NO
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
YES	YES	YES	NO	YES	YES	YES	YES	NO	YES	YES	NO	NO
YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	YES
YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	YES

9. Available on Multi-Modem 224e, $649 **10.** Optional 1200 bps upgrade card, $229.95 **11.** With MNP, $795 **12.** Purchase with or without **13.** With MNP, $845 **14.** Optional buffer, $149 **15.** LCD indicator **16.** Second year, $15 **17.** 2400G: 2400 bps

This chart contains a sampling of products, and the information herein is based on manufacturers' claims.

//e
MEMORY THAT REMEMBERS



17 MEGABYTES

Start with 1 megabyte on the Checkmate MultiRam™ RGB card. Then add from 256K up to 4 megabytes with Checkmate's MultiRam™ Plus card (or 16 meg when the 4 meg chips become available in 1987). You can now take control of enough memory in your //e to eliminate ever having to load application programs again. Load AppleWorks™, Pinpoint™, spelling checkers, modem software and other applications just once. Retire your floppy disks forever! No more searching for misplaced disks!

BATTERY BACK-UP

The memory on the MultiRam™ Plus card can be fully protected against power failures and brown-outs with the External Power Module option. MultiRam™ Plus even has its own built-in trickle charger for rechargeable batteries.

POWER OPTION

The power option for the MultiRam™ Plus consists of a wall power pack, a battery holder for four size "C" batteries and a cable. Alkaline or rechargeable NiCad batteries can be used (not included). The Alkaline batteries can maintain power to 1 megabyte of memory for up to 20 hours.

LOW POWER CONSUMPTION

Reduce the danger of a large memory card overheating or damaging your computer's power supply. When the wall power pack is connected, the MultiRam™ Plus card's memory is totally powered by the external power source. Memory chips represent more than 65% of the MultiRam™ Plus card's load to the computer's power supply.

INSTANT SAVE

We all know better than to allow a large file to remain in memory without saving the data every few minutes. Or do we? That huge AppleWorks file takes forever to save, and sometimes we make the risky decision to put convenience before safety. Normally if you try to save an AppleWorks file, you watch the cursor take a coffee break. With Checkmate's MultiRam™ Plus card, you're back inputting data within seconds.

AppleWorks is a registered trademark of Apple Computer, Inc.
Pinpoint is a registered trademark of Pinpoint Publishing, Inc.

BUILT-IN HARD DRIVE ABILITY

Hard drives are nice, but after a few years they often sound like a washing machine. Head crashes and other horror stories have kept many from purchasing a large storage device. Now there is a better way: MultiRam™ Plus can be used as an ELECTRONIC HARD DISK DRIVE. **NO** moving parts to wear out. **NO** heads to crash. **NO** big box sitting on the desk. The MultiRam™ Plus fits neatly inside the Apple //e. The biggest reason for electronic chip failure is the current surge of the on and off cycle. The Plus card seldom (if ever) needs to be powered down, thus significantly improving the life expectancy of the IC's.

PRICING

Good news! Because the MultiRam™ Plus card mates together with the MultiRam ™ RGB card, the cost of battery back-up is very reasonable. The duties of double HIRES graphics and 80 column displays, RGB color and standard protocols of the //e are all handled by the MultiRam™ RGB card. The MultiRam™ Plus card only performs the job of providing extra memory and battery backup. Even the memory chips are different on the MultiRam™ Plus card. Using modern 18-pin, power-saving CAS before RAS memory chips gives MultiRam™ Plus the power and expandability to use the new 4 megabit RAM chips when they become available. Note: The MultiRam™ Plus requires MultiRam™ RGB with at least 64K for installation.

	Suggested Retail Prices
MultiRam™ Plus (256K)	**$249.95**
External Power Module	**$39.95**

For more detailed information

Call the Manufacturer TOLL FREE

Checkmate Technology, Inc.

509 South Rockford Drive • Tempe, Arizona 85281-3021
(602) 966-5802 U.S.A.

™

(800) 325-7347

CIRCLE 105 ON READER SERVICE CARD

17 Meg IIe/1 Meg IIc

Want the best & easiest-to-use (most support) RAM card on the market — at the best price? Buy Checkmate Technology's State-of-the-Art **MULTIRAM RGB RAM CARD™ from us w/ BATTERY BACKED-UP RAM options that save programs like AppleWorks for years! FAST CHEAP REPLACEMENT FOR HARD DISKS, USER EXPANDABLE TO 17 MEGS,** (100%) compatible w/all 3rd party software/hardware, 65C816 Co-Processor option ($147), sharp 80 columns/Double Hi-Res, & FREE RGB! Direct substitute for Ramworks I-III™ (we think it's better) by Applied Engineering (also known as Preferred Computing) or Apple 80 col cards, has a **5 YR WARRANTY, 15 day money back guarantee, & FREE AUTOMATIC SOFTWARE UPDATES ONLY FROM US!**

MultiRam RGB expands to 1 Meg RAM + optional **BATTERY PROTECTABLE MultiRam Plus** piggyback expandable to 16 Meg's. **MultiRam IIe** expands to 768k. The **software & manual is the best & easiest-to-use on the market — without exception!**

FREE APPLEWORKS EXPANDER SOFTWARE W/EVERY CARD — loads ALL versions of Appleworks (in 30 seconds w/ AW 2.0), even printer routines, runs faster, expands Desktop over 2048k, stores 23,000 records & 4,800 word processor lines, segments lg files onto multiple disks! **FREE** AW TIME/DAY/DATE ON-SCREEN w/clock, AUTO-COPY TO RAM, PRODOS/DOS 3.3. RAM DISK & RAM TEST. Optional CP/M & Pascal Ram disks ($20/ea)!

		MultiRam RGB Card	MultiRam IIe Card
64k	**MultiRam**	169.	129.
320k	**MultiRam**	199.	159.
576k	**MultiRam**	229.	194.
832k	**MultiRam**	254.	229.
1024k	**MultiRam**	**279.**	← ← ← ←

		MultiRam Plus Piggyback	
256k	**MultiRam Plus**	220.	***NEW***
512k	**MultiRam Plus**	269.	***NEW***
768k	**MultiRam Plus**	316.	***NEW***
1024k	**MultiRam Plus**	359.	***NEW***
2-17 meg	**MultiRam Plus**	Call	***NEW***
Battery/AC Kit (for Plus)		**36.**	***NEW***

Apple IIe Enhancement Kit	**62.**
Cermetek 1200 Bd. modem IIe/II+/IIgs	**148.**
(+ FREE COMMUN. SUBSCR. & Ascii setup)	
Clockworks Clock (Thunder/Time HO™ compat)	**89.**
13" RGB Monitor & cable	**327.**
ProAPP 10/20 Meg Hard Disks (+FREE software)	**Call**
Apple Compatible Drives IIe/II+ (IIgs/IIc +19)	**135.**

Terms: Add $4-Ground or $6-Air shipping & phone # to each U.S. MultiRam card order (foreign orders/FPO/APO extra). Add 3% for MasterCard/Visa/Am Exp (include expir date) & P.O.'s. For fast delivery send Cashier's/Certified check/Money Order. C.O.D. (add $5) & personal checks accepted (allow 16 days). Tex res add 7 ¼% tax.

Checkmate Technology's MultiRam CX card easily expands your IIc to 640k and has a CX Plus Piggyback to add another 512k (1152k total)! It's 100% compatible with all IIc software/hardware & upgradable with a 65C816 kit ($95) — all at about 50% less power than Z-RAM™. Has the **SAME FREE SOFTWARE/UPDATES & 5 YR WARRANTY AS IIe CARDS.** Buy a C-VUE flat panel display for $287 w/ 512k or greater card.

256k	**MULTIRAM CX**	**179.**
512k	**MULTIRAM CX**	**209.**
768k	**MULTIRAM CX Combo**	**328.**
1024k	**MULTIRAM CX Combo**	**354.**
256k	**MULTIRAM CX Plus**	**210.**
512k	**MULTIRAM CX Plus**	**222.**

AutoWorks (Best AW Macro + more)	**37.**
1200 Bd. IIc Modem (add $20 for cable)	**144.**
Clip-on IIc Rechargable Battery	**119.**
IIc Flat Panel Display (w/512k>Mram)	**287.**
IIc System Clock	**66.**

WHY BUY FROM COIT VALLEY COMPUTERS RATHER THAN SOME MAIL ORDER HOUSES? Only we offer a **15 day MultiRam complete money back satisfaction guarantee,** extra software, more support, **free automatic software updates,** free 64k w/ each 256k/512k/768k IIe/RGB card. We know the products, & stock them for fast shipping! CALL FOR SUPPORT, QUESTIONS, PRICES, DISCOUNTS. **SCHOOLS & GROUPS WELCOME.**

Autoworks, Ramworks III/Timemaster II H.O./Z-ram, respective trademarks of Software Touch, Applied Engineering. **Call for RGB Connectors/cables (not included).**

ORDER NOW!

COIT VALLEY COMPUTERS (214) 234-5047
14055 Waterfall Way Dallas, Texas 75240

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE ( ) _____

SIGNATURE 4 A

QTY	DESCRIPTION	PRICE

MC/VS _____ SHIP. _____

_____ EXP _____ TOTAL _____

COIT VALLEY COMPUTERS
(214) 234-5047 MCI 2969684 Telex 6502969684 (WUI)
14055 Waterfall Way
Dallas, Texas 75240

CIRCLE 105 ON READER SERVICE CARD

Stand-Alone Modems

	NOVATION The Professional 1200XE	The Professional 2400XE	The Professional 2400	OKIDATA Okitel 1200	PRACTICAL PERIPHERALS Practical Modem 1200 SA	Practical Modem 1200 SA Mini	PRENTICE CORPORATION Popcom X100	P2122X	PT12AD	P2424
Price	$299	$650	$750	$499	$199	$239	$475	$325	$495	$695
Warranty period (in years)	2	2	2	2	5	5	5	5	5	5
Software included	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO
Max. transmission rate (bps)	1200	2400	2400	1200	1200	1200	1200	1200	1200	2400
Number of phone jacks	2	2	2	2	2	2	2	2	2	2
INDICATOR LIGHTS										
Auto answer	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES
Carrier detect	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES
Off hook	YES	YES	YES	YES	YES	YES	NO	NO	NO	YES
Receiving data	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES
Sending data	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES
Terminal ready	YES	YES	YES	YES	YES	NO	NO	NO	YES	YES
High-speed indicator	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES
DIALING & ANSWERING										
Auto-dial	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Auto-redial	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Auto-answer	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Call-progress reporting:										
Detects dial tone	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Detects busy signal	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Detects no answer	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Waits for silence	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES
Waits for second dial tone	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Waits for carrier	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adaptive dialing	NO[1]	NO[1]	YES	YES	YES	YES	YES	YES	YES	YES
Stores phone numbers	NO	NO	NO[1]	NO	YES	NO	NO	NO	NO	NO
Battery backup	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
Automatically hangs up phone	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
OTHER FEATURES										
Hardware error correction	NO	NO	NO[11]	YES	NO	YES	NO	NO	NO	NO[13]
Built-in help screens	YES	YES	NO[1]	NO	YES	YES	NO	NO	NO	NO
Complete AT-compatible command set	YES	YES	YES[12]	YES	YES	YES	YES	YES	YES	YES
Speaker volume manual	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Speaker volume software	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO
DCD switch	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES
DTR switch	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES
DIAGNOSTICS										
Compute ROM Checksum	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO
Self-test	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Test internal memory	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Analog loopback test	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Digital loopback test	YES	YES	YES	NO	NO	NO	NO	NO	YES	YES
Remote digital loopback test	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO

1. Available through software **2.** MNP option, $100 **3.** Has indicator light, however **4.** Available on model 224ARQ, $935 **5.** Firmware controlled **6.** 1450 bps and 2400 bps when communicating with other Microcom modems **7.** 2900 bps and 4800 bps when communicating with other Microcom modems **8.** MNP option, $50

PROMETHEUS PRODUCTS, INC. Promodem 300c (IIc only)	Promodem 1200G, Promodem 2400G	RACAL-VADIC 1200VP	2400VP	1200PA	TOUCHBASE SYSTEMS INC. WorldPort 1200	UNIVERSAL DATA SYSTEMS FasTalk 1200	FasTalk 2400	103J LP	212A LP	USROBOTICS, INC. Courier 1200	Courier 2400E	Sportster
$119	$299, $549	$295	$595	$495	$199	$450	$595	$165	$195	$499	$699	$149
2	2	2	2	1	2	1	1	1	1	1[16]	1[16]	1[16]
YES	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
300	1200[17]	1200	2400	1200	1200	1200	2400	300	1200	1200	2400	1200
1	2	2	2	2	1	2	2	2	2	2	2	2
NO	YES	YES	YES	YES[15]	NO	NO	NO	NO	NO	YES	YES	NO
NO	YES	YES	YES	YES[15]	NO	YES	YES	NO	NO	YES	YES	NO
NO	YES	YES	YES	YES[15]	NO	YES	YES	NO	NO	YES	YES	NO
NO	YES	YES	YES	YES[15]	NO	YES	YES	NO	NO	YES	YES	YES
NO	YES	YES	YES	YES[15]	NO	YES	YES	NO	NO	YES	YES	YES
NO	YES	NO	NO	YES[15]	NO	YES	YES	NO	NO	YES	YES	NO
NO	YES	NO	YES	YES[15]	NO	YES	YES	NO	NO	YES	YES	NO
YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES
YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES
YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES
NO	NO[14]	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NO	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES
YES	YES	NO	YES	YES	NO	YES	NO	NO	NO	NO	YES	NO
YES	YES	YES	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES
NO	YES	YES	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
NO	YES	NO	NO[1]	NO	NO	YES	YES	NO	NO	YES	YES	YES
NO	YES	NO	NO[1]	NO	YES	YES	YES	NO	NO	YES	YES	YES
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES
NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	YES	NO
YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES
NO	NO	YES	YES	YES	YES	NO	YES	NO	NO	NO	YES	NO
NO	NO	YES	YES	YES	YES	NO	YES	NO	NO	NO	YES	NO

9. Available on Multi-Modem 224e, $649 **10.** Optional 1200 bps upgrade card, $229.95 **11.** With MNP, $795 **12.** Purchase with or without **13.** With MNP, $845 **14.** Optional buffer, $149 **15.** LCD indicator **16.** Second year, $15 **17.** 2400G: 2400 bps

This chart contains a sampling of products, and the information herein is based on manufacturers' claims.

FURTHER INFORMATION

Anchor Automation
20675 Bahama Street
Chatsworth, CA 91311
(818) 998-6100
CIRCLE 450 ON READER SERVICE CARD

Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
Customer Service # (408) 973-2222

Applied Engineering
P.O. Box 798
Carrollton, TX 75234
(214) 241-6060

AST Research, Inc.
2121 Alton Avenue
Irvine, CA 92714
(714) 553-0340
CIRCLE 452 ON READER SERVICE CARD

Bytcom
2169 Francisco Blvd., Suite H
San Rafael, CA 94901
(415) 485-0700
CIRCLE 453 ON READER SERVICE CARD

Cermetek Microelectronics
1308 Borregas Avenue
Sunnyvale, CA 94088-3565
(408) 752-5000
Customer Service # (800) 862-6271
CIRCLE 454 ON READER SERVICE CARD

Computer Friends
14250 NW Science Park Drive
Portland, OR 97229
Customer Service # (503) 626-2291
CIRCLE 455 ON READER SERVICE CARD

Concord Data Systems, Inc.
397 Williams Street
Marlborough, MA 01752
(617) 460-0808
Customer Service #
(800) CDS-TALK
CIRCLE 456 ON READER SERVICE CARD

CTS Datacomm
6900 Shady Oak Road
Eden Prairie, MN 55344
(612) 941-9100
Customer Service # (800) 328-6104
CIRCLE 457 ON READER SERVICE CARD

Everett/Charles Marketing
6101 Cherry Avenue
Fontana, CA 92335
(800) 443-1860
In CA (800) 821-0589
CIRCLE 458 ON READER SERVICE CARD

Fastcomm Data Corporation
12347-E Sunrise Valley Drive
Reston, VA 22091
(703) 620-3900
Customer Service # (800) 521-2496
CIRCLE 459 ON READER SERVICE CARD

Hayes Microcomputer Products, Inc.
P.O. Box 105203
Atlanta, GA 30348
Customer Service # (404) 662-7100
CIRCLE 460 ON READER SERVICE CARD

Intec
21751 West Nine Mile Road
Suite 122
Southfield, MI 48075
(313) 352-0066
Customer Service #
(800) 628-2828 x 915
CIRCLE 461 ON READER SERVICE CARD

Microcom, Inc.
1400A Providence Highway
Norwood, MA 02062
(617) 762-9310
Customer Service # (800) 322-3722
CIRCLE 462 ON READER SERVICE CARD

Multi-Tech Systems, Inc.
82 Second Avenue SE
New Brighton, MN 55112
(800) 328-9717
In MN (612) 631-3550
CIRCLE 463 ON READER SERVICE CARD

Novation, Inc.
20409 Prairie Street
Box 2875
Chatsworth, CA 91311
(800) 231-6437
In CA (818) 996-5060
CIRCLE 464 ON READER SERVICE CARD

Okidata
532 Yellowship Road
Mt. Laurel, NJ 08054
(609) 235-2600
Customer Service # (800) OKIDATA
CIRCLE 465 ON READER SERVICE CARD

Practical Peripherals
31245 La Baya Drive
Westlake Village, CA 91362
(818) 991-8200
CIRCLE 466 ON READER SERVICE CARD

Prentice Corporation
266 Caspian Drive
P.O. Box 3544
Sunnyvale, CA 94088
(800) 858-0088
In CA (408) 734-9810
CIRCLE 467 ON READER SERVICE CARD

Prometheus Products, Inc.
4545 Cushing Parkway
Fremont, CA 94538
(415) 490-2370
CIRCLE 468 ON READER SERVICE CARD

Touchbase Systems, Inc.
16 Green Acre Lane
Northport, NY 11768
(516) 261-0423
CIRCLE 470 ON READER SERVICE CARD

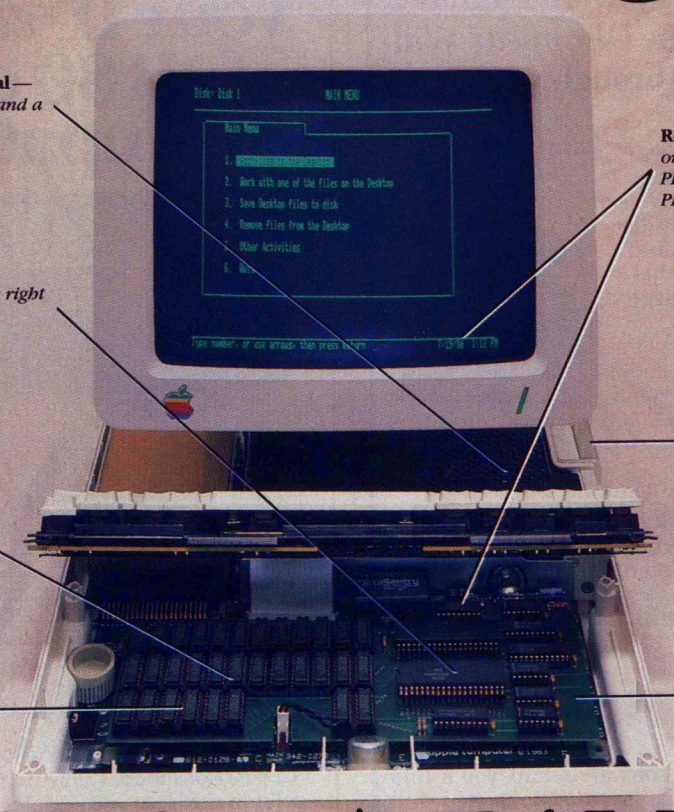
Transend Corporation
The Village Square
884 Portola Road
Portola Valley, CA 94025
(415) 851-3402
CIRCLE 471 ON READER SERVICE CARD

Universal Data Systems
5000 Bradford Drive
Huntsville, AL 35805-1953
(800) 221-4380
In AL (205) 721-8000
CIRCLE 472 ON READER SERVICE CARD

USRobotics, Inc.
8100 North McCormick Blvd.
Skokie, IL 60076
(312) 982-5001
Customer Service # (800) 982-5001
CIRCLE 473 ON READER SERVICE CARD

Zoom Telephonics
207 South Street
Boston, MA 02111
(617) 423-1072
Customer Service # (617) 423-1076
CIRCLE 474 ON READER SERVICE CARD

Z-RAM® gave the IIc guts. Now comes the glory.



No jumper wires, clips or drive removal—*so installation takes only a few minutes and a screwdriver.*

Optional 65C816 16-bit processor *plugs right in with no other component changes.*

Up to 1 MEG memory *(you choose how much) lets you store, load and run programs up to 30 times faster.*

Printer buffer *lets you continue working while printing AppleWorks files.*

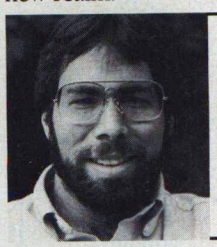
Real-time clock *displays time and date on AppleWorks™ screens and files, and is PRO-DOS compatible for use with other PRO-DOS software.*

Pinpoint's AppleWorks accessories *with RAM enhancement software—together a $118 value—only $79 if ordered with Z-RAM Ultra.*

Run CP/M® programs *with Z-RAM Ultra's built-in Z-80B microprocessor.*

Introducing Z-RAM Ultra.

Your Apple IIc is about to become a computer you never dreamed it could be. Because the most exciting chapter in the Z-RAM history of turbo charged IIc's has just been written. It's called Z-RAM Ultra. And it takes IIc expansion into a whole new realm.



"I recommend Applied Engineering products wholeheartedly." (Of course, Steve's IIc has a Z-RAM installed.)

Steve Wozniak, the creator of Apple Computer

Ultra smart. Ultra speedy.

With any Z-RAM Ultra, your AppleWorks word processor capacity will instantly increase from 2,250 lines to over 15,000 and the maximum number of records from 1,350 to over 25,000. Available desktop memory rockets to over 700K with *all* of AppleWorks loaded into RAM. Z-RAM Ultra even expands the clipboard and autosegments large files so they can be saved on two or more disks. Nothing else comes close to enhancing AppleWorks like this!

Z-RAM Ultra will completely load your programs into RAM, then run them up to 30 times faster. And our included RAM disk is compatible with Applesoft, PRO-DOS, DOS 3.3, PASCAL and CP/M.

That's just the beginning.

Memory and speed are only part of the story. Z-RAM Ultra 3 also has a built-in Z-80B microprocessor that allows it to run CP/M programs (the largest body of software in existence)—including WordStar, dBase II, Turbo PASCAL, Microsoft BASIC and more. A PRO-DOS compatible battery backed-up clock not only displays time and date on the AppleWorks screen, but will time and date stamp any PRO-DOS file. And a printer buffer handles printing of AppleWorks files so you can continue working.

Patented technology and a computer-aided design allow Z-RAM Ultra to run with extremely low power consumption—less than half the power drain of other memory cards. And all the IC chips are in sockets.

Call to order or for more information!

Z-RAM Ultra comes with simple instructions, RAM disk software, Z-80 operating system, CP/M manual, a five-year "hassle-free" warranty, and all the AppleWorks enhancements we're famous for.

If you want to run CP/M software, but don't need more memory, we suggest our Z-80C card, priced at only $159.

CALL 214-241-6060 TO ORDER TODAY. 9 a.m. to 11 p.m. seven days, or send check or money order to Applied Engineering. MasterCard, Visa and C.O.D. welcome. Texas residents add 5⅛% sales tax. Add $10.00 outside U.S.

Prices:

Z-RAM Ultra 3 (With memory, clock and CP/M)
256K—$329.00 512K—$379.00 1 MEG—$459.00
Z-RAM Ultra 2 (With memory and clock)
256K—$269.00 512K—$319.00 1 MEG—$399.00
Z-RAM Ultra 1 (Memory only-expandable to 512K)
256K—$199.00 512K—$249.00
Pinpoint with RAM enhancement software $79.00
(List price $118)
16-bit 65C816 Upgrade $99.00

Applied Engineering

The Apple enhancement experts.

P. O. Box 798, Carrollton, TX 75006 (214) 241-6060

CP/M is a registered trademark of Digital Research, Inc.

Applied Engineering™

RAMUP™ For RAMSPEED.

Watch Your Boot Time *Disappear* With This Utilities Breakthrough.

RAMUP™ The Instantaneous RamCard Utility.

RAMUP™ utility software allows you to flip within 2 seconds between up to 20 Apple programs. Consider the advantages of eliminating disk swapping through a program that even a computer novice can easily use. It's true. You don't need a knowledge of programming or pathnames to get started. The entire program with an easy-to-understand instruction book, full guarantees and technical support is only $34.95.

Your Integrating Program Link

RAMUP™ is the integrating link for immediate access between programs like AppleWorks, GraphWorks, Sensible Speller, Ascii Express, BPI, Multiscribe and most other software packages. Besides being able to flip from program to program, users can boot up other software and then immediately return back to any of the programs on their RamCard(s).

The Best No-Fault Guarantees Mean That You Can't Go Wrong.

Even if you aren't an expert in software set-up, you'll find that our walk-through installation directions and full technical support will get you up and running *in a matter of minutes.* Then, if you aren't completely satisfied with RAMUP™, *we'll give you your money back in the first 20 days.* You also won't have to worry about defects — *if anything goes wrong in the first five years of use, we'll send you a replacement free of charge.* Call right now, toll free 1-800-443-6697 to order your RAMUP™ program. While you're talking to us, consider some of our other money saving values below.

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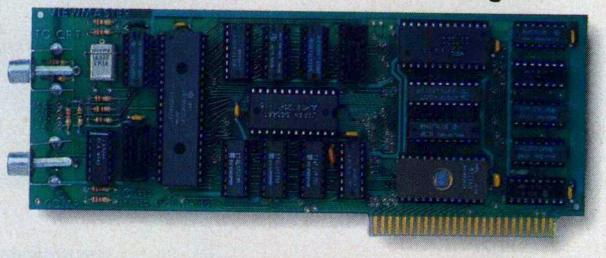

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SUPRTERM		✓					✓	✓	
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VISION 80	✓	✓			✓				
OMNIVISION		✓					✓	✓	
VIEWMAX 80	✓	✓			✓			✓	
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One look at the chart will give you some of the reasons there's only one smart choice in 80 column cards for your Apple. But the real secret to Viewmaster 80's success is something even better: Total compatibility.

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Now anyone with an Apple II+, Franklin, Laser 128, Apple IIe or IIGS preferring to use slots 1 through 7 can now enjoy the speed and performance that they've been waiting for.

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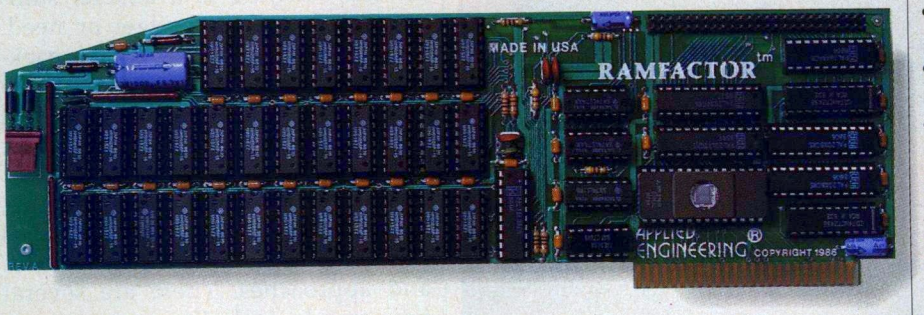

Very Compatible

All the leading software is already compatible with RamFactor. Programs like AppleWorks, Pinpoint, BPI, Managing Your Money, Dollars and Sense, SuperCalc 3A, PFS, MouseWrite, MouseDesk, MouseCalc, Sensible Speller, Applewriter IIe, Business Works, ReportWorks, Catalyst 3.0 and more. And RamFactor is fully ProDos, DOS 3.3, Pascal 1.3 and CP/M compatible. In fact, no other slot 1-7 memory card is more compatible with commercial software.

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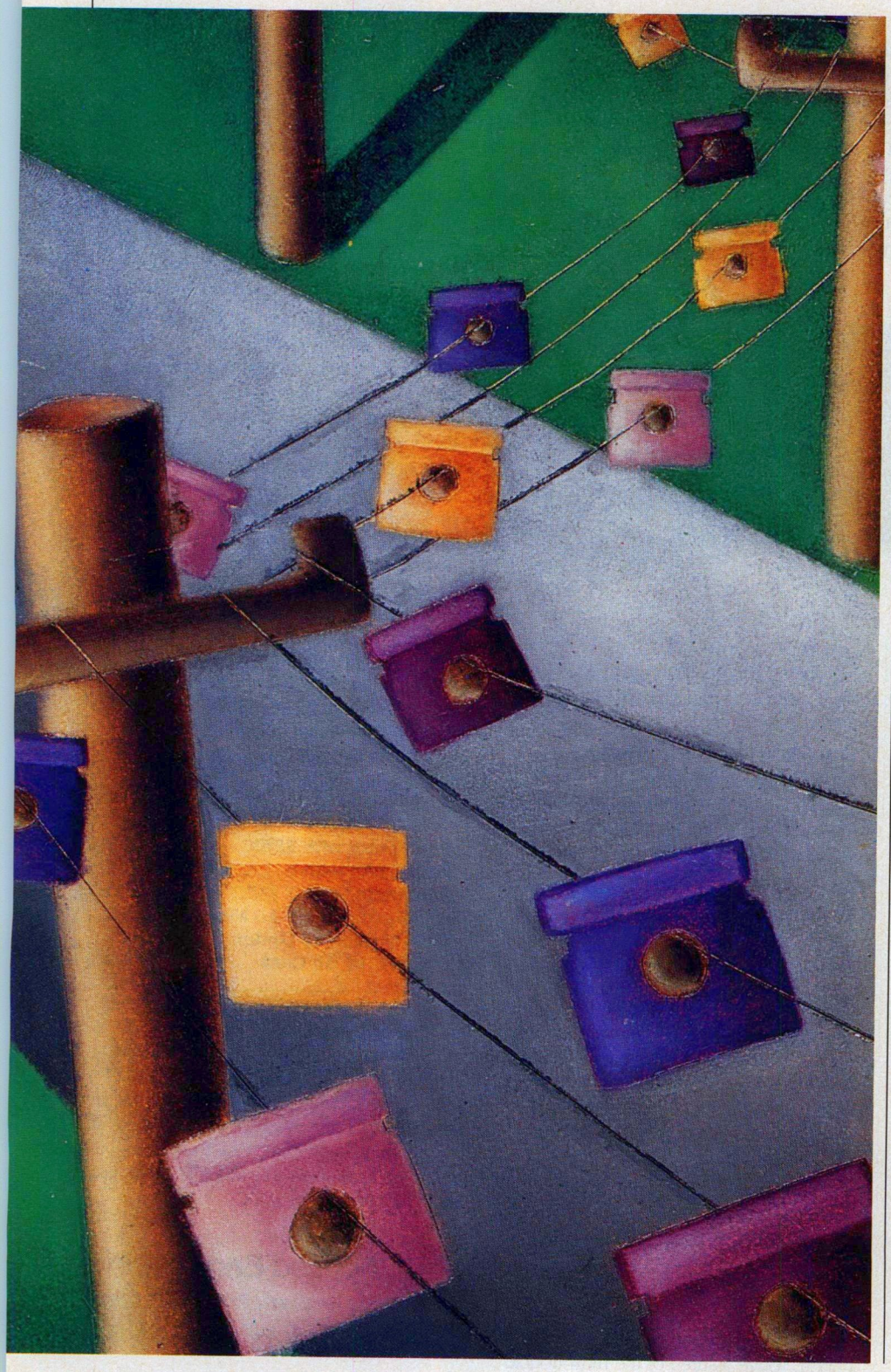
COVER STORY

ONLINE

BY MICHAEL FISCHER



When you get a modem to communicate with another computer, that's not quite enough. You also need special software. Whereas a printer works with little, if any, additional programming, a modem does not. You can communicate in only a rudimentary way without additional software.

Happily, plenty of telecommunications software is available, sufficient to meet any budget or need. Some of this software comes packaged with modems, but this article looks only at programs that are sold separately.

Tele-Trends

Telecommunications software, like many other types of software, is rapidly changing, with new features and approaches. There are several new trends, including mouse operation, AppleWorks interface, ProDOS file-transfer format, and Apple IIGS compatibility.

Three of the programs this article discusses permit the use of a mouse to make operation easier. Depending on the software involved, use of the mouse may vary from optional (Easy Com/Easy Go) through highly desirable (MouseTalk) to mandatory (Person to Person).

Several of the programs provide varying degrees of compatibility with the popular AppleWorks integrated program. One works as a pop-up-type desk accessory coresident with AppleWorks (Pinpoint). Some programs provide for easy transfer of files between the AppleWorks word-processing format and ASCII text-file format (CommWorks and Point to Point), and others use the AppleWorks style of file-card menu display without actually interacting with AppleWorks itself (CommWorks, Easy Com/Easy Go, and Point to Point).

Another development concerns the ease with which you can transfer files with a modem. Normally a pro-

ILLUSTRATION BY LISA DESIMINI

Selecting Software

A survey of telecommunications software for the Apple II family

gram transmits only the data portion of a file. This method presents a particular problem with the ProDOS operating system, which works with different file types and access codes as well as creation and modification data. To tackle this problem, *A+* contributing editor Gary Little has developed a transfer format for these attributes called Binary II. A Binary II file has an extra block of data attached to it that contains various aspects of the file. Several of the major commercial information services, including GEnie and CompuServe, have accepted the format for use. The newest version of Point to Point (also by Gary Little), contains a way to automatically convert files to and from the Binary II format. Other programs are bound to follow suit.

Another area of change concerns Apple IIGS compatibility. The IIGS modem port uses a different controller chip than do other Apple II serial interfaces, including that of the Apple IIc. Telecommunications software written before the IIGS's introduction generally cannot use the IIGS serial port, although it can run with a plug-in serial interface. Programs rewritten or especially written to be compatible with the IIGS serial port include Apple Access II, CommWorks, MouseTalk, and Point to Point.

Buyers' Guide

When you first look through descriptions of telecommunications software, you may feel you are reading material in a foreign language—terms such as *baud, parity, XModem protocol,* and *terminal emulation* assault your brain. Let's look at the meaning of some of the terms and then take an overview of some of the more popular programs. Accompanying this article is a chart comparing the features of the packages.

Telecommunicating through a modem can take place at many different speeds, measured in terms of bits per second (often called a baud rate although this use of the term is technically incorrect—*A+* employs the term *transmission rate,* and uses *bps* [for *bits per second*] rather than *baud* to designate the speed). Most software can handle the common speeds of 300 and 1200 bps as well as 2400, which is emerging as the new speed of choice. Software that can handle faster speeds, up to 19,200 bps, is desirable for transfer of files between two computers hooked together directly (i.e., a modemless transfer) but unnecessary for other uses.

Terminal Emulation

Many of us use telecommunications to transfer data from one location to another, between our computer and a remote unit. Normally when your computer is connected to a remote system (known as a host), it functions as a data terminal that is connected to that unit. To do that it must emulate, or act like, a terminal that is known to that host.

The most common form of emulated terminal is a TTY or teletypewriter terminal. Somewhat less common are Digital Equipment Corporation's VT-52 and VT-100 terminals. Several other types of terminals also exist. You do not normally need to emulate a variety of terminals, although you may find VT-52 emulation helpful for graphics applications and for communicating with university mainframe computers.

You can transfer data between your computer and a host in the form of data files. The simplest method, called the "capture buffer" method, is to send the data a character at a time and have the receiving computer capture the data as it receives it, usually in an area of random-access memory (RAM).

Since the RAM's size is limited, most software allows a method of signaling that permits one computer to tell the other to stop sending data for a while so that the first computer can store the contents of the RAM

buffer on disk. Normally conveying this message entails sending an XOFF (short for *transmit off*) character. The computer sends an XON (for *transmit on*) character when it is again ready to receive data.

Error Detection

Phone-line noise that interferes with a voice conversation is not normally a critical problem—we can either figure out what other people meant, or we can ask them to repeat what they said.

Computers are dumb, however. If yours receives the characters A-PLUM instead of A-PLUS, it won't recognize this letter substitution as an error. You can often correct text mistransmissions with a text editor, but if the data consists of a series of numbers (such as stock quotations), you won't be able to recognize that the closing price for Apple Computer stock was 49, not 99.

One common method of transmitting data that has built-in error detection is that developed by Ward Christensen and known variously as the Christensen protocol, the XModem protocol, or the Modem 7 protocol. If you are going to be transmitting data between your computer and another computer, you should check that your software can handle XModem-protocol file transfers. The ability to handle other protocols is not important, as most remote systems don't work with them.

Making Macros

Macros are another important feature of some programs. A macro is a sequence of keystrokes or instructions that you assign to a single keystroke or key combination. For example, if your password to an information service is "OpenUp," you can define a macro that transmits that password whenever you press a particular key. Additional macro capabilities include pausing until the program receives a particular character or group of characters from the remote computer and taking one of several actions, depending on the characters received. If you are willing to take the time to program your own macros ahead of time, you will be more than repaid in ease of use and time saved.

Some remote hosts require that you be able to send them a special character, known as a break character. The break is not an ASCII character but an interruption (or break) in the modem carrier signal. Some hosts require a normal break (approximately ¼ second), but some require a long break (about three seconds). Many programs provide the ability to send a normal or long break.

A helpful feature in many telecommunications programs is a telephone directory. You can place the phone numbers and names of remote systems in the directory and not need to remember the number. In many cases, you can also store the communications parameters and log-on and other macros with the number.

The following descriptions of telecommunications software, and the accompanying chart of features, should help you through the maze of selecting a program that will meet your needs.

Apple Access II, Version 1.2

Apple Access II, Version 1.2

This program uses an AppleWorks-style "file-card" display to show its various menu levels. Users familiar with AppleWorks will find the format of the program comfortable.

You must have either an Apple modem or a Hayes Smartmodem or compatible to use Access II. In addition, you must have a Super Serial Card or compatible in slot 2 or use the IIc or IIGS modem port. (Note that certain modems, such as the Cermetek Apple 1200 modem, emulate a Super Serial Card and a Hayes Smartmodem.) The program has recently been revised to allow operation with the Apple IIGS, using the built-in serial port.

Access II permits you to move through the directory and subdirectory structure of a ProDOS disk by scanning the available volumes, selecting one and scanning its top-level contents, and so forth until you find the file you wish. If you know the full pathname to locate the file, you can always just enter the pathname.

Access II lacks macro keys, although it does have powerful command files that you have to call by their full pathname. This requirement prevents the practical use of a command file for automating relatively simple functions involving fewer than ten keystrokes.

You can program a command file to perform different operations depending on the response from the host computer; up to four different alternatives can be active at one time.

If you are an advanced user, you may appreciate the Datascope function in Access II, which displays the hexadecimal value of each character received.

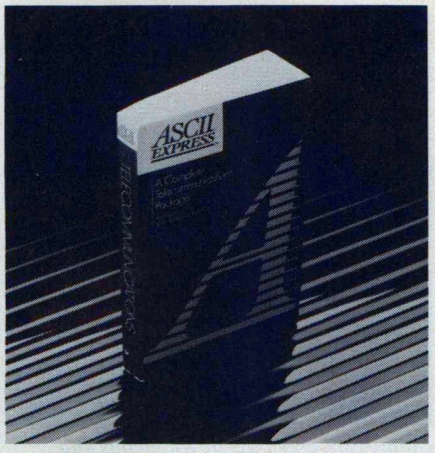
Access II has a well-designed interactive training disk and clearly written manual.

ASCII Express "The Professional"

ASCII Express "The Professional" has the most telecommunicating power among Apple II telecommunications programs. It comes in both a DOS 3.3 version (4.20) and a ProDOS version (4.30) and works with all types of Apple II computers. No matter what combination of modem and interface card/port you have (except for the IIGS serial port), you will find that ASCII Express will work with it. (It does work with the GS with a plug-in modem board.)

All this power comes at a price. The program is quite difficult to use, once you get beyond its more simple functions.

You can modify nearly everything in ASCII Express to suit your



ASCII Express "The Professional"

preferences. For example, the editor cursor-control keys are initially set to correspond to the WordStar setup. If you don't like that, you can change their arrangement. The Install program has more than six menus of options you can specify.

ASCII Express provides full means for remote operation. You can set up your system to be commanded from a remote unit, even using the remote unit to upload files and download them to and from from your system. You can require use of a password for entry into your system from a remote computer and restrict its use to specified files.

ASCII Express also provides the most support for the advanced features of the Novation Apple-Cat modem, including the use of the Apple-Cat serial port and the Baudot code mode of operation (see "A Hardware Buyer's Guide" in this issue).

Because ASCII Express works with all pre-IIGS Apple II computers, it does not allow use of the open- and closed-apple keys of the Apple IIe and IIc (and the apple and Option keys of the Apple IIGS). Neither does it provide special routines for use with AppleWorks files.

CommWorks, Version 1.3

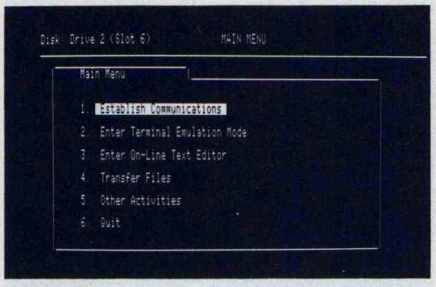
CommWorks is a telecommunications program that follows the AppleWorks file-card menu system and command structure, making it easy for AppleWorks users to learn. It uses AppleWorks' open-apple-key combinations such as H to print the screen and S to save the capture buffer to disk.

You have several options for capturing incoming text in CommWorks. The standard RAM capture buffer holds 35,000 characters; unfortunately, the program does not send XOFF/XON characters to the remote computer to enable it to stop transmission while you save the copy buffer to disk. You can use a disk-based copy buffer, though, in which everything that would normally go into the RAM capture buffer goes into a disk file instead.

Alternatively, if you have Applied Engineering's RamWorks or Z-Ram card, or Checkmate Technology's MultiRam card, you can have multiple RAM capture buffers, up to 16, depending on the size of the memory card.

When either setting up or storing a capture buffer on disk with CommWorks, you can specify whether the buffer should be stored as a text file or as an AppleWorks word-processing file.

The program stores the parameters for each service, including terminal settings, phone numbers, and macros, in a communications file. Up to 16 macros can be stored in one

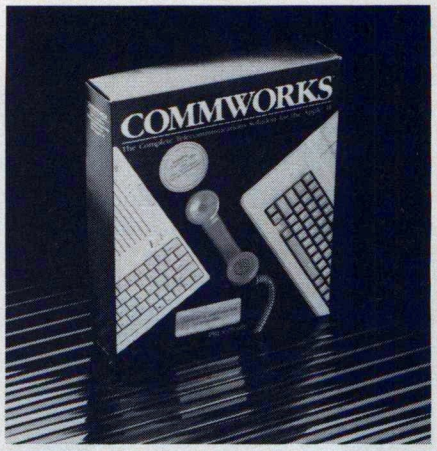


CommWorks uses a file-folder structure, similar to that of AppleWorks, for selecting choices from menus.

file. Macros can perform some of the CommWorks functions and can wait for a single character from the remote computer. The program has no Macro command to let you take alternative actions that depend on the text received from the remote host.

CommWorks provides terminal emulation of the DEC VT-52 and VT-100 as well as the standard TTY terminal.

The program works with many different modem and card combinations on the Apple IIc, 128K Apple IIe, and the Apple IIGS. It is one of



CommWorks, Version 1.3

the few programs that work with the Novation Apple-Cat modem in the1200-bps full-duplex mode.

Easy Com/Easy Go, Version 4.04

Easy Com/Easy Go is billed as an integrated communications and word-processing program—the *word processing* part refers to its full-featured text editor.

The text-editing capabilities of Easy Com/Easy Go are significantly greater than those of nearly all other telecommunications programs. It has left, right, center, or fill justification—either a line at a time or a block of text at a time. You can also delete and move blocks of text.

The text editor lacks several features, though, that you would expect in most full-featured word processing programs, most noticeably search and replace.

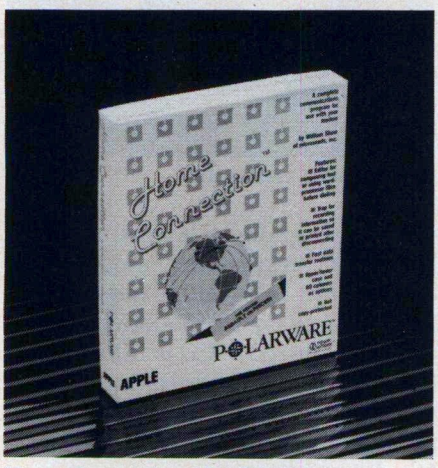
Easy Com/Easy Go uses the familiar AppleWorks-style file-card display to show menus and submenus. You select from the menus by pressing Return to toggle a two-choice selection or by pressing the left- and right-arrow keys to cycle through multiple selections.

Apple IIc owners will have to be sure their modem cable includes the "carrier detect" line, because this program requires that signal. You'll either need a special adapter from Transend ($20), or you'll need to build your own cable, because the standard Apple cable won't do.

With Easy Com/Easy Go, you can define 22 different macro keys for each phone number, although only 11 can be active at any one time. The

macros can let the computer wait for a single transmitted character or a specified time interval before operating.

Easy Com/Easy Go does not provide automatic, unlimited redialing of numbers, although it does redial a number up to five times before giving up.



Home Connection, Version 2.1

Home Connection, Version 2.1

Home Connection is a fairly basic package that does an adequate job of communicating with the limited number of setups with which it works fully.

You must type in the "base address" (in hexadecimal) of the serial interface as part of the program configuration unless you are using the Hayes Micromodem. Fortunately, the programs' manual gives this value for several interfaces, including the Apple Super Serial Card, the Apple Communications Card, the Networker Modem, and the MB Communications Card. For other cards, you'll need to know this information or know how to find it. In other words, if you don't have a standard hardware setup, you really need to be fairly expert to get this program going.

The program works with the standard Apple 40-column screen, the IIe/IIc/IIGS 80-column screen, or the Videx Videoterm 80-column card.

You can assign macros to any control-key combination except three reserved keys. The macros, whose length is restricted to eight characters, can generate only keystrokes, though, and not program commands or conditional branching.

You can set up translation tables to convert any character into another character. Likewise, you can specify that a character be translated into another one before transmission to the remote computer. This ability is helpful if the remote system requires special coding.

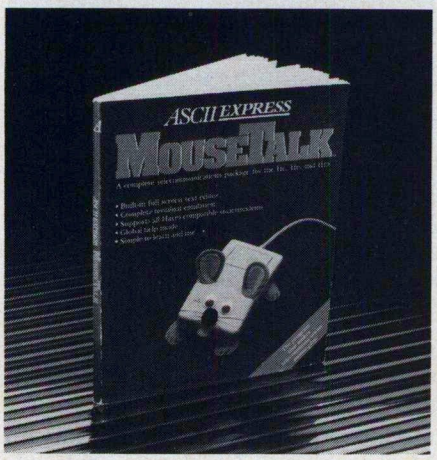
File transfer is restricted to the ASCII-text-capture buffer or the BTRAN protocol, which only the Home Connection, BTRAN, and Netmaster software use.

The program comes with a small manual that contains all the information you need to run the system—the typographic layout and design make the manual somewhat difficult to use, however.

MouseTalk, Version 1.20

MouseTalk is one of the newest telecommunications programs on the market, but it is one with a distinguished heritage: It is based on ASCII Express Professional.

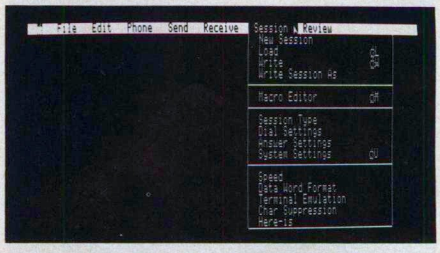
As you would expect from its name, MouseTalk is mouse-operated, although you can run the program without a mouse, with some difficulty. It uses the "Mousetext"



MouseTalk, Version 1.20

characters available on the Apple IIc, Apple IIGS, and the enhanced Apple IIe and thus requires that you use it on one of these machines.

Mouse operation, together with the program's GS/Macintosh-like interface, makes MouseTalk one of the easiest programs to use. It even comes with its own mouse-controlled copy program for making a working copy of the program.



MouseTalk uses pull-down menus and works best with a mouse.

MouseTalk works with an external modem connected to either a Super Serial Card or the Apple IIc or Apple IIGS modem port. Internal modem cards that emulate that combination also work with MouseTalk.

You can ask the program to automatically redial a number a specified number of times or continually until connected. With MouseTalk you can specify that the most recently received 8000 characters be saved to the capture buffer, a handy feature for people like me who forget to turn on the capture buffer until some useful information has already scrolled onto the screen.

You can easily move through ProDOS subdirectories with MouseTalk file commands. Just select the Prefix option and tell the program to move up or down a level in the subdirectory hierarchy. If you have a hard-disk drive with multiple subdirectory levels, you will appreciate not having to type the different subdirectory names in order to reach your intended file.

MouseTalk uses session files to help automate your telecommunicating. Each session file can contain up to 20 different macro commands, with up to 10 of these issued by an open-apple-plus-number-key combination.

You can specify alternative actions, depending on the text that a host computer has sent. You can even start MouseTalk and have a session file run automatically by giving

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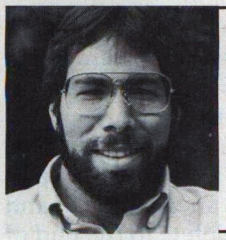

"TransWarp is great! I have replaced all my other accelerators with it!"

Steve Wozniak, the creator of Apple Computer

An important difference.

With TransWarp, software runs up to three times faster than with other cards, since the others can't accelerate programs in auxiliary memory. That's why TransWarp is so much faster than the rest. Nearly all of today's more powerful programs run partially or completely in auxiliary memory: programs like AppleWorks, Pinpoint, Managing Your Money, SuperCalc 3a, BPI and Pascal, to name a few. Why settle for a card that accelerates only part of the memory?

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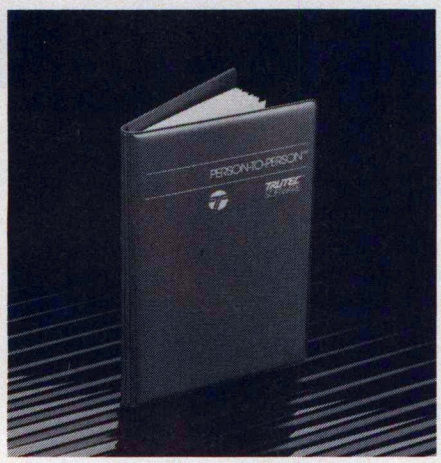
the ProDOS Intelligent Run (-) command to the session file.

MouseTalk's editor is a full-screen text editor with a clipboard to aid in the movement of text. You select text in the editor with the mouse. Some of the other handy editor commands let you find a string of characters or change the case of selected text.

Person to Person, Version 2

Person to Person has the distinction of being the most mouse/desktop-oriented of the Apple II telecommunication programs. It provides mouse operation, pull-down menus, icons, and a general desktop environment for all functions.



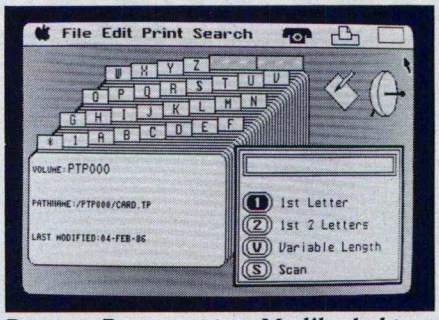
Person to Person, Version 2

Person to Person is more than just a telecommunications program. It is also a Rolodex-type word-processing and database program with limited mail-merge capabilities.

The desktop has a Rolodex icon, with letter tabs that permit you to choose a portion of the Rolodex for display and selection. A Rolodex card holds a name, phone number, up to five lines of address, up to five memo lines, and a single classification letter. The card can also hold a name for use in a letter salutation with the mail-merge function.

Up to 1500 cards can be present in any Rolodex file, and you can have multiple Rolodex files on disk, but the larger the Rolodex file is the smaller the capture-buffer/word-processing file is.

The Person-to-Person word-processing program is also mouse-based. The program is always in the



Person to Person creates a Maclike desktop with high-resolution graphics and works best with a mouse.

Insert mode, and it has no Move, Copy, or Replace commands.

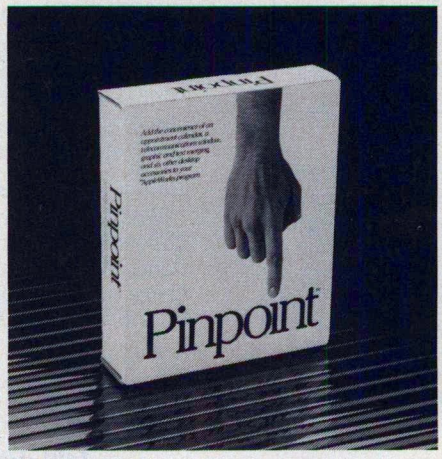
Person to Person provides a method of capturing your keystrokes and the remote terminal's prompts and automating them for future use in what is called an Auto-Com file. You can also create Rolodex cards with help information that you can use when you're on-line with a remote service.

Other than the Auto-Com file, Person to Person has no macro capability, although you can tie system settings to telephone numbers.

Pinpoint, Version 2.0.1

Pinpoint is a multifunction, desk-accessory-like program that works along with AppleWorks, Apple Writer, Word Perfect, and/or Applesoft BASIC under ProDOS. (For a full review of the Pinpoint program, see the April 1986 issue of *A+*.) Pinpoint has two telecommunications-related functions.

The phone dialer takes a look at whatever is on your screen until it finds something that looks like a



Pinpoint, Version 2.0.1

phone number. It then waits for you to press Return and proceeds to dial the number through your modem's auto-dial function.

The communications function in Pinpoint performs many of the functions of stand-alone telecommunications programs. It can automatically dial from stored numbers and log on with your identification number and password. You can send a text file or AppleWorks word-processing file to a remote computer and catch incoming data in a capture buffer.

With the optional Modem Enhancement Kit ($29 from Pinpoint), you can also translate incoming or outgoing characters and encrypt characters. The Modem Enhancement Kit also provides a limited macro function with which you can define any of up to eight keys to represent a series of keystrokes. You can get more sophisticated macro capabilities in the KeyPlayer program, also available from Pinpoint, which you can use with Pinpoint desk accessories.

Point to Point, Version 2.0

Point to Point by Gary Little, an *A+* contributing editor, follows the AppleWorks file-card system of menu selection and contains many features that makes its use intuitive for AppleWorks users. As mentioned above, this new version contains the Binary II file format standard.

The program uses the same standard open-apple-key commands that AppleWorks uses, including open-apple/S to save a file, open-apple/H to print the screen, open-apple/E to toggle between the Insert and Overwrite modes in the editor, and open-apple/Y to delete to the end of a line.

Point to Point provides up to 16 macros for each telephone-number entry. Macro commands include waiting for one of two alternate text strings and branching according to which string is received, and sending or receiving files. You can assign a key combination (closed-apple/a letter) for each macro and link the macros to each other. With Point to Point, you can also specify that the

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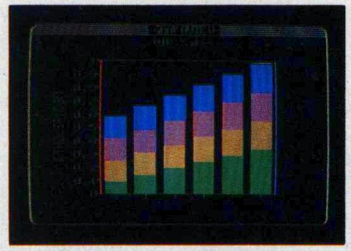

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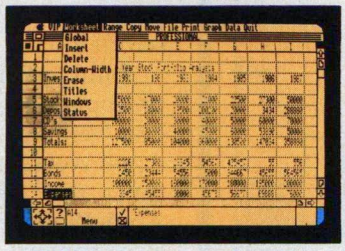

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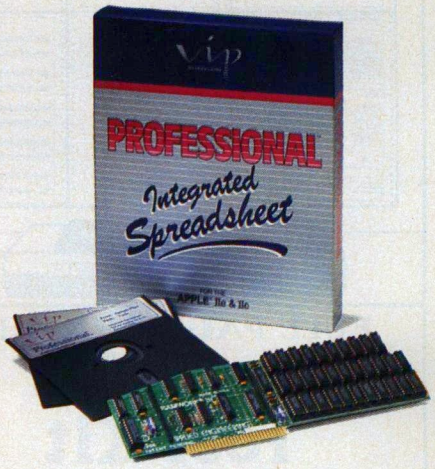

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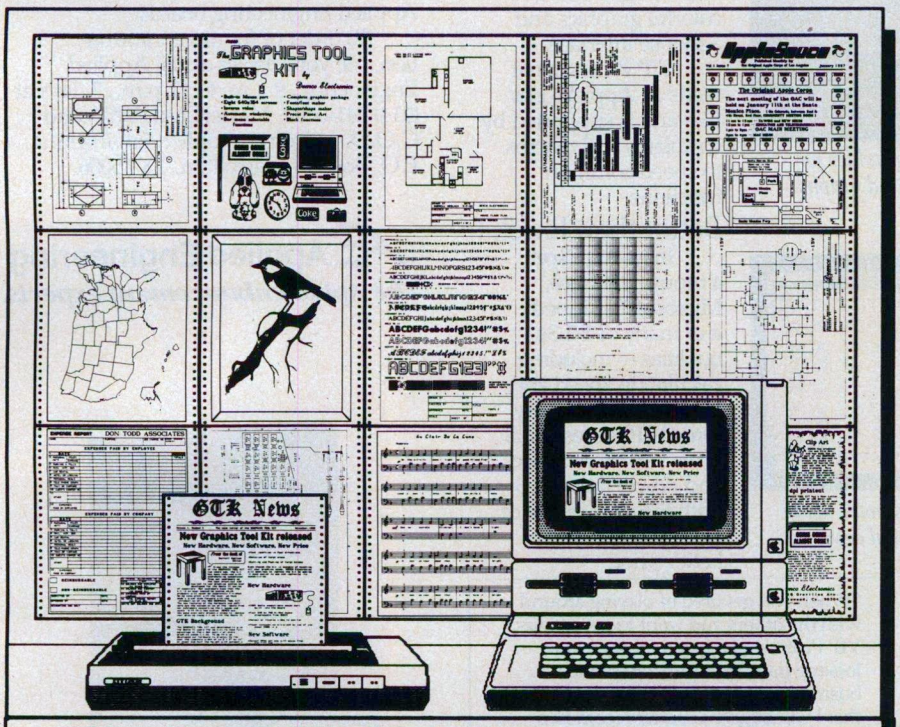

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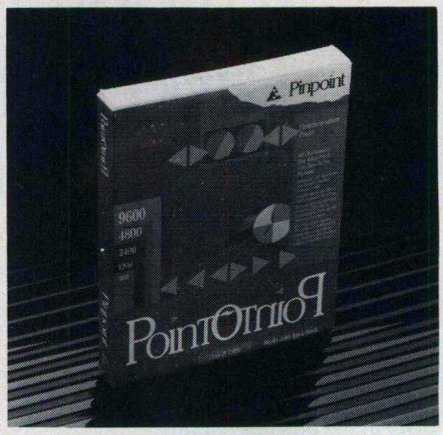

Point to Point, Version 2.0

first macro be activated automatically when the connection is made.

No matter where you are in Point to Point, you can usually find on-line help. The line-oriented editor has a help key, the macro-definition screen displays all the macro commands, and the terminal-mode screen displays the most frequently used command keys. The terminal screen also shows the amount of time you have been on-line as well as the number of free characters in the capture buffer.

One useful command permits you to send the contents of the terminal screen to the capture buffer. Another command lets you review the previous 255 lines of text that have scrolled by.

Point to Point also provides a link to AppleWorks files. You can specify that either a text file or an AppleWorks word-processing file be sent; the program converts the AppleWorks file on the fly. You can also convert a text file into an AppleWorks word-processing file. With the utility programs that come with the program, you can also convert Applesoft BASIC, machine-language, or Pascal text files to ProDOS text files.

Although Point to Point works only with an Apple IIc, 128K Apple IIe, or Apple IIGS, it works with nearly any modem and interface-card combination.

Softerm 2, Revision 2.01

Softerm 2 excels at terminal emulation and file transfer. It can emulate a variety of terminals including

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ONLINE Software Survey

Program	Version #	Baud Rate	Operating System	Works With II+	Works With IIGS	Works With 64K IIe	Uses Mouse
APPLE ACCESS II	1.2	110–9600	ProDOS	NO	YES	YES	NO
ASCII EXPRESS ProDOS	4.3	45.5–9600	ProDOS	YES	NO	YES	NO
ASCII EXPRESS DOS 3.3	4.2	45.5–9600	DOS	YES	NO	YES	NO
COMMWORKS	1.3	110–9600	ProDOS	NO	YES	NO	NO
EASY COM/EASY GO	4.04	110–2400	ProDOS	YES	NO	YES	YES
HOME CONNECTION	2.1	50–4800	DOS	YES	NO	YES	NO
MOUSETALK	1.2	50–19200	ProDOS	NO	YES	NO	YES
PERSON TO PERSON	2.1	300–1200	ProDOS	NO	NO	NO	YES
PINPOINT	2.0.1	300–1200	ProDOS	NO	NO	NO	NO
POINT TO POINT	2	110–9600	ProDOS	NO	YES	NO	NO
SOFTERM 2	2.01	50–9600	DOS	YES	NO	YES	NO
TALK BACK	1.2	110–4800	ProDOS	NO	NO	NO	NO
TRANSEND		110–2400	DOS	YES	NO	YES	NO
Z-TERM PROFESSIONAL		45.5–2400	CP/M	YES	NO	YES	NO

*Size is for 128K Apple; 3K on 64K Apple

Softerm 2, Revision 2.01

the standard TTY and the DEC VT-52 and VT-100. The program comes in two forms, one for the II Plus and IIe with 64K, the other for the 128K IIe, the IIc, and the IIGS.

The program comes with a three-key keypad that attaches either to the game input port (IIc, 128K IIe, and IIGS version) or to a keyboard-expander card that comes with the program and goes into any available slot. The keypad provides you with extended key functions including the ability to call menus. Various keys on the keyboard, in combination with one or more of the keypad keys, work the same as special keys on the emulated terminal.

The other significant feature of Softerm 2 is its ability to transfer files from either a DOS 3.3, CP/M, or Pascal disk without the need for disk conversion. In fact, it can read a file from a CP/M disk even if you do not have a CP/M card in your Apple. You can transfer your files with XOFF/XON, XModem, or the special Softerm protocol.

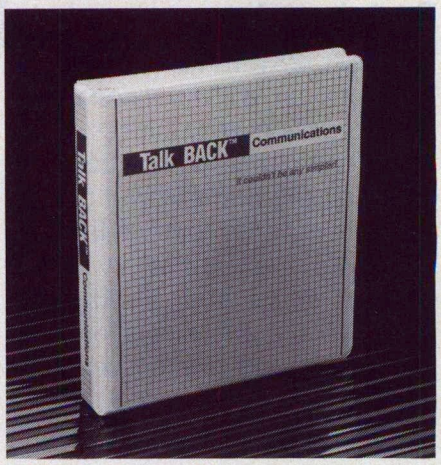
Softerm 2 is not an easy program for beginners, although it provides extra power for advanced users. If you need the power of terminal emulation or CP/M or Pascal file transfer, it is one of the few programs that provides these features.

Talk Back, Version 1.2

Talk Back is an easy-to-use telecommunications program that provides many useful features without a significant level of complexity.

You can create up to 19 macros that not only send up to one line of text but can also perform terminal commands. It has no conditional branch command, however. If you need more than one line for a macro, you can create a task file, which is nothing more than a longer macro.

The editor in Talk Back is easy to use and lets you quickly delete a large block of text. You can then copy the deleted text from the delete buffer into another location in the file, thus performing a cut-and-paste operation. You can also set text markers and perform a search forward or backward in the document.



Talk Back, Version 1.2

Talk Back saves the files for each separate information service in a separate ProDOS subdirectory on your disk. You can create a file, called a command file, and save it in each service's subdirectory. That file provides on-line help when the program is running and can contain either information about the Talk Back commands or about the commands that particular service requires.

Talk Back has two helpful disk-

Macros		Print Buffer	Phone	XOFF			Emulation			Remote
Number	Decision	Size	List Size	Available	Modifiable	XModem	VT-52	VT-100	Break	Operation
UNLIM.	YES	DISK	8	YES	NO	YES	YES	NO	L	NO
12	YES	23K	—	YES	YES	YES	YES	YES	V	YES
12	YES	26K	—	YES	YES	YES	YES	YES	V	YES
18	NO	35K	—	NO	NO	YES	YES	YES	L	NO
11	NO	47K*	20	YES	NO	YES	NO	YES	—	YES
23	NO	42K	16	YES	YES	NO	NO	YES	S	NO
20	YES	33K	—	YES	YES	YES	YES	YES	S	YES
UNLIM.	NO	30K	1500	YES	NO	YES	NO	NO	—	NO
—	NO	—	8	YES	NO	NO	NO	NO	—	NO
16	YES	18K	16	YES	NO	YES	NO	YES	S	YES
200+	NO	24K	50	YES	YES	YES	YES	YES	S	YES
19	NO	30K	—	NO	NO	YES	NO	YES	S	NO
11	NO	13K	8	YES	NO	YES	NO	YES	S	YES
12	YES	31K	—	YES	NO	YES	NO	YES	V	YES

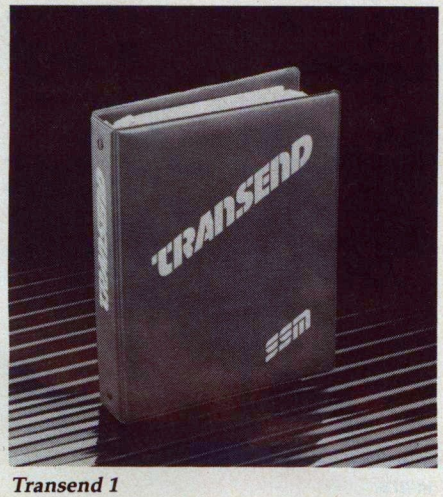
S = short, ¼-second break L = long, 3-second break V = variable, user-selectable long or normal break

handling utilities. The Extended List command provides a description of every file and subdirectory on the disk, a particular help to those of us with hard-disk drives with many layers of subdirectories. The Copy command can copy an entire directory and its contents.

Setting up Talk Back is easy. It requires a Super Serial Card or a IIc modem port and an Apple or Hayes Smartmodem-compatible modem.

Transend 1

Transend 1 is a close relative of Easy Com/Easy Go. It provides many of the same features, although Transend 1's text editor performs only rudimentary functions.



Transend 1

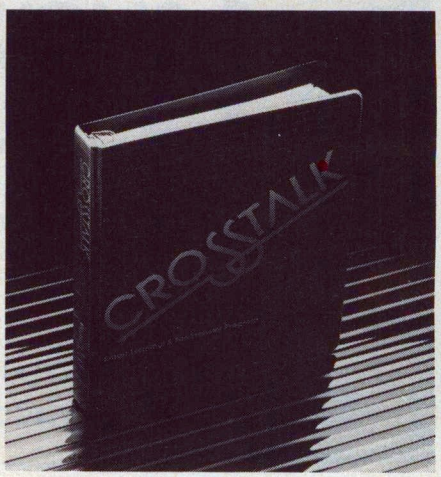
The program is menu-oriented, with each selection from one menu taking you to a different menu. Each move from one menu to another requires the loading of the new menu from disk, resulting in slow operation. Its Expert mode allows you to enter menu choices without using a menu. This mode speeds up program operation somewhat, although the commands are cryptic, since they are based on the letter option keys on the menus.

For Other Operating Systems

If you use the CP/M operating system and want to transfer files, you have several choices of software. Z-Term Professional comes from the author and publisher of ASCII Express Professional and provides many of the features that that program offers. CrossTalk is a program available for many different CP/M systems. There are also public-domain programs for the CP/M operating system, usually called Modem 7 or some variation thereof.

Z-Term Professional

If you use the UCSD p-System (Apple Pascal), a telecommunications program that runs on that system is P-Term Professional, also from the author and publisher of ASCII Express Professional.



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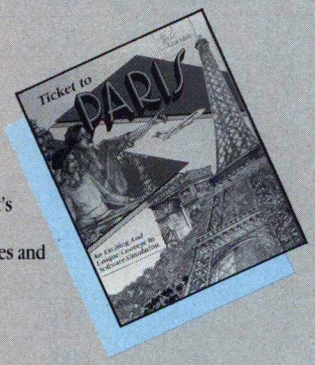

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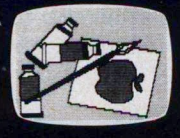

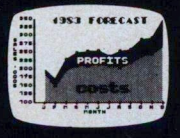

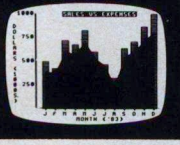

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ONLINE

Communications Modules

At least three programs for the Apple II provide a telecommunications module as part of an overall program that performs other functions as well.

Mousewrite, Version 2.6.8. The review of word-processing programs in the October 1986 *A+* discussed Mousewrite. The program contains a communications desk accessory that works with a Super Serial Card or equivalent. It can handle different data formats and save incoming text in a Mousewrite document. A phone directory with up to eight entries is available.

Newsroom. The September 1985 *A+* contained an in-depth review of this product. With the "wire service" portion of the program, you can transfer stories, pictures, or pages from an Apple, IBM, or Commodore computer running Newsroom to another computer of the same or different type running Newsroom. The program works with many different serial-interface cards and external modems but not internal modems.

Swyftcard and SwyftDisk. In addition to giving you word-processing, information-retrieval, calculation, and programming functions, these products can act as telecommunications software. They require a Super Serial Card in slot 2 of your Apple IIe computer.

Incoming text is automatically saved as part of your SwyftCard or SwyftDisk file, as is any response you enter. Configuration is a bit tedious the first time. These programs have no macros or XModem file-transfer capabilities.

Other programs, such as Write Away and Word Juggler, also offer a communications module. ✚

Michael Fischer is the author of The Apple IIGS Technical Reference *as well as* 65816/65802 Assembly Language Programming *(both from Osborne/McGraw-Hill) and coauthor of the* Apple II Expansion Guide *(Tab Books). He is an attorney, author, columnist, and programmer. He has owned and used Apple computers for nearly ten years.*

PRODUCT INFORMATION

Pinpoint
Pinpoint
5901 Christie Avenue, Suite 501
Emeryville, CA 94608
(415) 654-3050
List Price: $69
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ASCII Express "The Professional"
United Software Industries
8399 Topanga Canyon Blvd.
Suite 200
Canoga Park, CA 91304
(818) 887-5800
List Price: $129.95
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CommWorks
PBI Software, Inc.
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Foster City, CA 94404
(415) 349-8765
List Price: $95
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Crosstalk
Crosstalk Communications
Division of Digital
Communications Associates, Inc.
1000 Holcomb Woods Parkway,
Suite 440
Roswell, GA 30076
(404) 998-3998
List Price: $195
CIRCLE 477 ON READER SERVICE CARD

Easy Com/Easy Go
Transend Corporation
The Village Square
884 Portola Road
Portola Valley, CA 94025
(415) 851-3402
List Price: $129
CIRCLE 478 ON READER SERVICE CARD

Home Connection
Penguin Software
P.O. Box 311
Geneva, IL 60134
(312) 232-1984
List Price: $29.95
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MouseWrite
Roger Wagner Publishing, Inc.
10761 Woodside Avenue
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(619) 562-3670
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Person to Person
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(415) 653-4651
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Apple Access II
Apple Computer, Inc.
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List Price: $75

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List Price: $125
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List Price: $149.95
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(303) 593-9540
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Talk Back
Russ Systems
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Z-Term Professional
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MouseTalk
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Micro-Chem
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San Diego, CA 92102
(619) 236-9319
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The Newsroom
Springboard Software, Inc.
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Minneapolis, MN 55435
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I can do taxes with AppleWorks?
Indeed you can, using 1040Works Tax Software

1040Works and **1040Works-X** templates convert AppleWorks to a comprehensive, low-cost tax preparation program that will calculate Form 1040, print Schedules A,B,C,D,E,F, G,SE and W; and compute depreciation, employee expenses, childcare credit, moving expense, alternative minimum tax, and more. Includes user guide, financial organizer, time-saving custom macros for all macro programs. Accepts financial data from Quicken or Dollars and $ense. Requires Apple II or compatible with at least 128K RAM, any version of AppleWorks. Printer recommended. (Use of macros is optional, but if you want a macro program, send $39.95 for AutoWorks.)

HOW DOES IT WORK?
1040Works and **1040Works-X** modules are data files that configure the AppleWorks spreadsheet as tax schedules and forms. Modules load like any other data file; no hardware or software modifications needed. Both programs calculate each form, advance totals to later forms and print most schedules without recopying data. Uses standard AppleWorks commands. InCider magazine said last year's version (called TAXWORKS) was the easiest tax software to set-up and use that it tested.

WHAT'S 1040WORKS-X?
The standard AppleWorks desktop is 55K, big enough for about half the commonly used tax forms. The standard **1040Works** includes two major spreadsheet modules of about 50K, with half the forms on each. Data is moved between them with an electronic Transfer Port. If you have an Apple with 256K or more, however, your AppleWorks desktop is big enough to hold all commonly used forms. **1040Works-X** links them up on a single spreadsheet, saving the data transfer step.

WHAT DO USERS SAY?
"Easy to use; cancelled my appointment with my accountant." • "Made ciphering taxes a lot of fun." • "Fun and challenging; my first ever attempt at taxes on a computer." • "Good software at a fair price." • "First class program; excellent value." • "Prompt and courteous assistance." • "Learned AppleWorks features I never used."

HOW DO I ORDER? Fill out this form

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1040Works-X (258K-up) @ $24.95 _____
On a 3.5 disk add $3.00 _____
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SOFTWARE TOTAL _____
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Street/Apt#: _____
City/State/Zip _____

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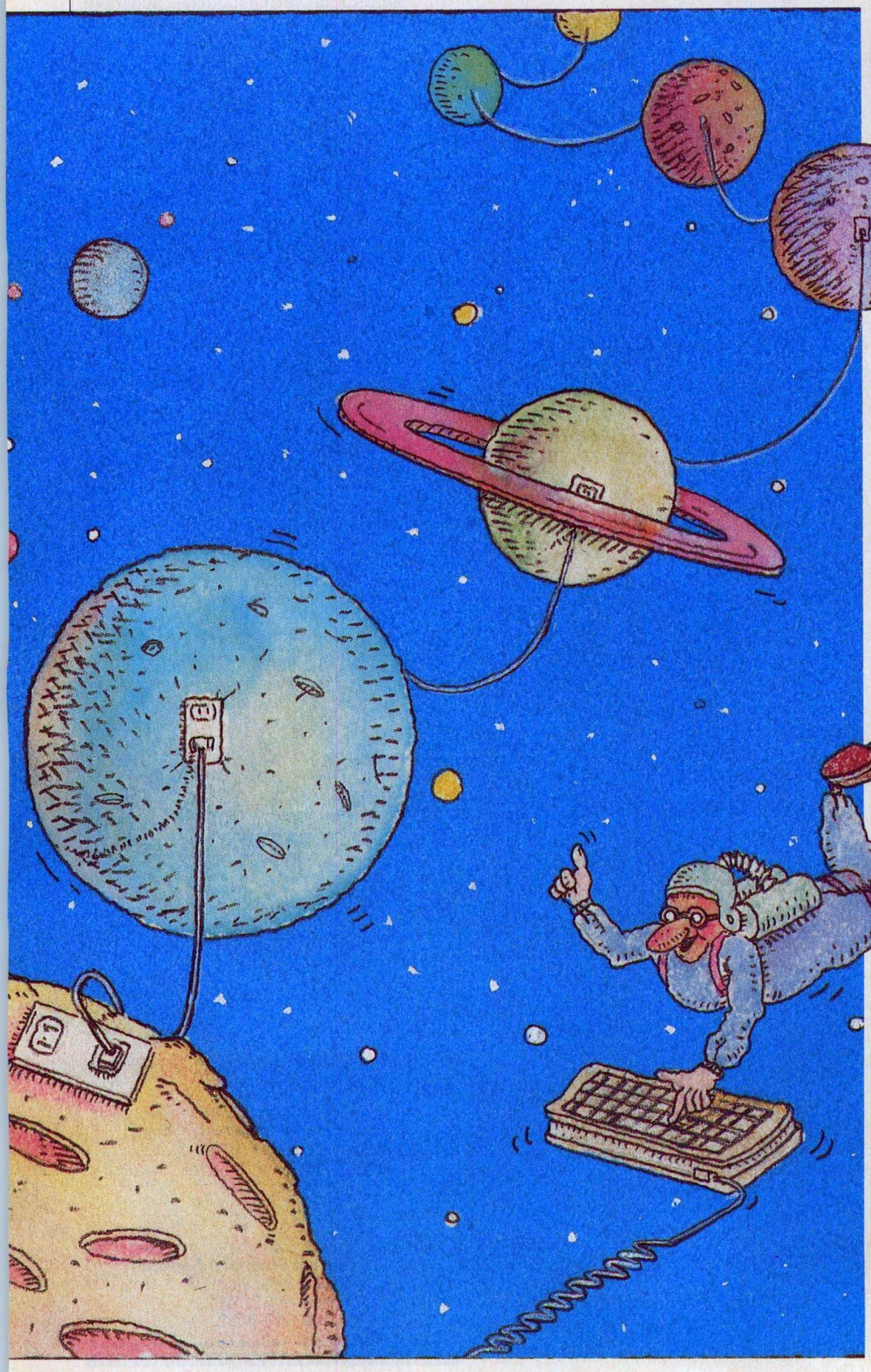
Melville, NY 11747
Tel: (516) 261-8652

COVER STORY

ON-LINE

BY RUSS LOCKWOOD



About a year and a half ago, I reported an amazing statistic: Modems had achieved only 10% market penetration. This percentage meant that 90% of all computers did not have a modem, surely a golden opportunity for modem manufacturers to exploit. Rest assured, these figures did not go unnoticed. The major marketing efforts of 1986 garnered impressive results for 1987.

The prognosticators at Link Resources Corporation claim that 20% of all U.S. households with personal computers now also have modems. Link contends that this percentage will increase to more than 50% by 1990.

Rosy forecasts aside, what do you do with a modem once you have it?

Telecommunications consists of three parts: hardware, software, and information. The potential of the hardware is not unlocked without software, and the two together are for accessing information. Hardware and software are in the spotlight on the preceding pages of this issue, but for information, well, you've come to the right place.

Network vs. Database vs. Gateway

Telecommunications services fall into three main categories: network, database, and gateway. Although features and functions overlap, their general characteristics are as follows:

• **Network services:** offer a wide variety of features centering on bringing people with the same interests together. The strong points include electronic mail; interactive real-time communication between two or more subscribers; narrowly defined on-line clubs; electronic shopping; and recreation-oriented offerings such as single- and multiplayer games, movie reviews, and restaurant guides. Do not dismiss such services as mere entertainment, for

ILLUSTRATION BY KIRK CALDWELL

A Guide to the On-Line Galaxy

Telecommunications tour: network, database, and gateway services

they often contain stock and other financial quotes, on-line encyclopedias, wire-clipping options, public-domain software, special forums for businesses, and manufacturer support for software. All telecommunications services in this category offer a stand-alone Apple II section (the Macintosh section is usually separate so you won't waste time looking in the Mac section for II information and vice versa). The most widely known and used network is CompuServe.

- **Database services:** provide a vast repository of information just waiting to be tapped. They are an electronic version of a university library. The information covers a broad range of subjects, from accounting to zoology, and represents a large portion of material published in the English language and some foreign languages too. Searching usually involves specific keywords. The rates are rather expensive, so these services lend themselves to business use rather than home use, although some services in this category offer a substantial discount for evening access. The most widely known and used database is Dow Jones News/Retrieval.
- **Gateway services:** function as one-stop connections for accessing other telecommunications services. This category is more important for telecommunications-service operators than it is for users, as gateway services function primarily as a conduit for the transfer of information. Tymnet and Telenet are excellent examples of gateway services.

Some Pointers

Before we start our whirlwind tour of the telecommunications world, you should be aware of a few considerations. Newcomers should definitely pay attention, and veterans may want a reminder.

The first item you need to enter the on-line world is some sort of membership kit. You contact the service, ask for information, and fill out the forms in the kit. Most services charge a one-time sign-up fee above and beyond the per-hour charges, although many services bundle free, introductory memberships with modems and telecommunications software. Read the information on per-hour charges carefully—connecting during off-peak times can save you plenty.

Perhaps the most important thing to remember is moderation. When you log onto a service, your on-line meter starts running. Most of the telecommunications services bill you through your credit card. Hence, the services have a direct line from your wallet to the company coffers.

As a corollary, plan ahead. If you are using an expensive database, plan your search *before* you go on-line. If you want to send an E-mail message, use your word-processing program to compose the message, save it in ASCII, and then upload it with your telecommunications software. Likewise, download your E-mail to disk and then read it. These easy tips can save you connect time—and in the on-line world, time is money.

Learn the command that lets you stop what you're doing and return to the command line. In many systems, this command is Control-C, but *check your system manual*. This Break command will save you time and frustration.

Speaking of commands, two nearly universal commands are Control-S to make output pause to allow you to read the screen, and Control-Q to resume output.

Never, ever, ever, ever, divulge your personal password to anyone on the system. These services are public, national networks. Unfortunately, unscrupulous people prey on unsuspecting users. A favorite trick is staging a fake disconnect message and then watching the neophyte "log on" again. Another ruse is to claim to be a staff member confirming account identifications and pass-

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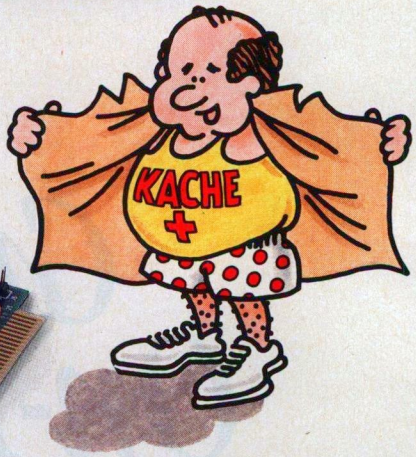
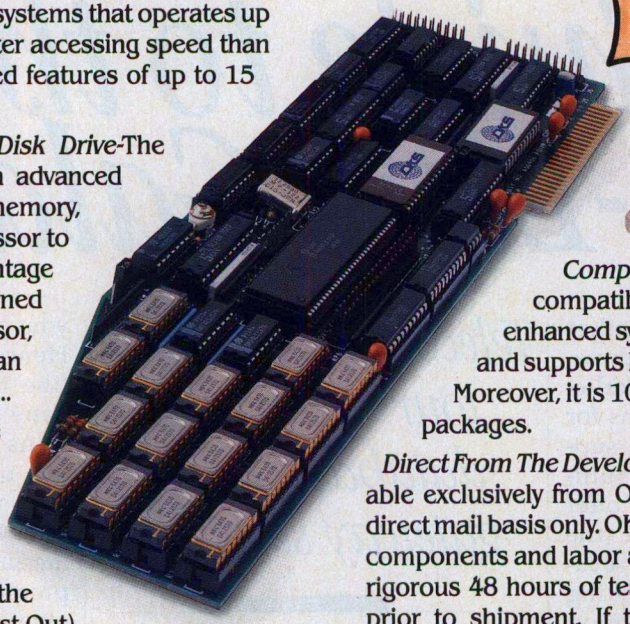


*The Kache Plus Card...Shocking Speed **PLUS** Expanded Performance*-The Kache Plus Card is a powerful floppy disk adapter board for Apple *II* systems that operates up to six floppy drives. It offers faster accessing speed than hard disk drive ***PLUS*** the added features of up to 15 popular expansion boards.



Faster Accessing Than Hard Disk Drive-The Kache Plus Card combines an advanced form of RAM, known as cache memory, with the power of a microprocessor to achieve a 2.5 to 1 speed advantage over hard disk accessing. Governed by a Hitachi 64180 microprocessor, the Kache Plus Card becomes an intelligent RAM disk card that...

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Multi-Function Features-The Kache Plus Card also doubles as a multi-function board with a choice of up to 15 expanded features for your Apple *II* system. And, by utilizing the benefits of the Kache Plus Card's cache memory and 64180 microprocessor, each feature offers a performance advantage over comparable expansion boards on the market.

The standard Kache Plus Card comes complete with several of the most popular expansion features to date. And, with the optional features offered it can be easily upgraded to grow with the sophistication of the computer market. In addition, future innovations from OKS will be carefully engineered for easy assimilation into the standard Kache Plus Card design.

Standard Features: 256K Cache Memory/RAM Disk, On Board Clock/Calendar with Battery Back-up; Utilities for Clock/Calendar; Back-up Utilities Diskette; Concurrent Operation of 2 Floppy Drives; User Friendly/Mouse Compatible Menus; On Board Firmware Utilities for Future Upgrade.

Optional Features: 512K Cache Memory/RAM Disk Upgrade; Expandor Module which includes: Concurrent Operation of 6 Floppy Drives, Parallel Printer Interface, 256K/512K Parallel Print Buffer, Super Serial Interface, 3 Line Serial Interface, EEPROM; External Power Supply; Cable Options which include: Duo-Disk Cable, Serial Interface Cable, Parallel Interface Cable; Replacement Battery for Clock/Calendar.

Compatibility - The Kache Plus Card is compatible with Apple *II*, *II+*, *IIe* and *IIe* enhanced systems with 1-6 floppy disk drives, and supports DOS, PASCAL, ProDOS and CP/M. Moreover, it is 100% compatible with all software packages.

Direct From The Developer-The Kache Plus Card is available exclusively from Ohio Kache Systems (OKS) on a direct mail basis only. OKS offers a full year warranty on all components and labor as well as a 30 day trial period. A rigorous 48 hours of testing is completed on each unit prior to shipment. If the Kache Plus Card does not perform as we say it will, simply return it to OKS and your money will be fully refunded.

Don't Buy A Hard Disk Drive Or Another Add-On Board... Buy the Kache Plus Card instead. Priced at:

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CIRCLE 178 ON READER SERVICE CARD

words. Do not be fooled by such tricks. The Break command works wonders, as does logging off. You should report such activities to the service, even if all you can detail is the time and location of the harassment. You've all heard the expression about a few bad apples.

Finally, do not be afraid of asking questions. What is now routine for veterans was once arcane sleight-of-chip. The vast majority of on-line users are friendly and willing to help a newcomer.

Service with a Smile

The following overview provides capsule descriptions of the features and functions of the various telecommunications services. The services listed here are the major players, the ones that are here today and likely to be around tomorrow. Certainly, other specialized services exist, but for now, I do not think you can go wrong with any of the following services. I've broken them down into the Network, Database, and Gateway categories.

Network Services

CompuServe. With more than 300,000 subscribers, CompuServe is the largest of the telecommunications services. A large part of its success stems from the diversity of its features. If you can think of a topic, chances are CompuServe has a special forum for discussing it. Forums are areas set aside for a specific topic where users can read and leave messages, set up a conference to "talk" to several people at once, and upload and download programs of interest.

The Apple II Forum, called MAUG (Micronetworked Apple Users Group), is especially busy. You will feel like a kid in a candy store when you sign on—there is so much to see and retrieve. Even better, you have access to a broad range of knowledgeable people who can provide answers to even the most obscure questions you may have.

E-mail, real-time CB simulator, 128K of personal disk storage, electronic shopping, stock quotes, commodities prices, airline flight information, an on-line encyclopedia, a news service, and several adventure and war games all make CompuServe the overwhelming favorite of telecommunicators.

At 1200 bps, the per-hour charge is $12.50 during nonprime time (weekday evenings after 6 P.M. and on weekends and holidays). At 300 bps, it costs about half that. Considering all you can access, these are reasonable rates. The sign-up fee is $39.95.

The Source. Frankly, The Source puzzles me. Here is a network service that has a terrific E-mail function that is truly easy to use, enough special-interest groups (SIGs) to rival CompuServe's forums, a real-time conference feature, a news service, an on-line encyclopedia, air-

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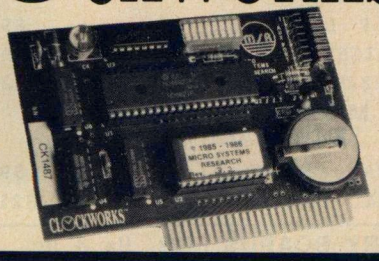

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LONG LIFE LITHIUM BATTERY, ALWAYS WORKS, NO RECHARGING IS EVER NEEDED.	YES	NO	NO
INCLUDES A DIGITAL I/O PORT FOR ADVANCED APPLICATIONS.	YES	NO	NO
EXTERNAL SOURCE INTERRUPTING AND FLAGGING.	YES	NO	NO
BUILT-IN TIME SETTING COMMANDS	YES	NO	YES
CLOCK PRICE	$99.00	$129.00	$149.00
BSR REMOTE CONTROL OPTION	$29.00	$39.00	$49.00

ClockWorks has 24 hour & AM/PM modes, software selectable interrupts, time & date stamps, ProDOS, DOS 3.3, and Pascal files, and comes complete with four disk sides full of useful software, including "The Time Machine", a new powerful disk based appointment book/time management system written especially for ClockWorks.

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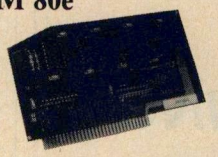
RAM 80e™



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line schedules, electronic shopping, and games. Business options include Stockvue, which monitors the performance of 3000 stocks; Bizdate, a daily business-news service; and OTC Newswire Daily, a source of information about over-the-counter markets, portfolio management, corporate research, and on-line trading. CompuServe and The Source are like Coke and Pepsi, Hertz and Avis, or McDonalds and Burger King. The debate over which is better could be as significant as determining whether Lite Beer from Miller is less filling or tastes great.

Yet with all this going for it, why does The Source have only a quarter of the number of subscribers that CompuServe has?

Cost. Face it, you want more baud for the buck, and The Source's $49.95 membership fee (down from $100) is rather steep. Even though the 300-bps rate is comparable to CompuServe's and the 1200-bps rate is actually $1.75 cheaper during nonprime time, The Source charges a $10-per-month minimum. Look, I've come to accept the direct connect into my credit card, but I'm not about to leave my VISA in the auto-answer mode. If the company ever decreases the sign-up fee and drops the monthly minimum, look for me on The Source.

Delphi. Delphi has come a long way since its start-up in February 1983 and has managed to grab enough of a following to make it the third-largest general-service network. Although its command structure seems a bit outdated, it has steadily added new features and functions, not to mention several ex-CompuServe staff members. All indicators point to a promising future.

Delphi has many of the same communication, information, and entertainment offerings as do CompuServe and The Source, including E-mail, conferencing, banking, shopping, SIGs, financial and commodity news, airline schedules, and games. It is not as extensive as its competitors, but the price is right.

Delphi charges $7.20 per hour for 300-bps, 1200-bps, and 2400-bps service during nonprime time. That's a pretty good deal at 1200 bps. Now, if it could only get rid of its $49.95 membership fee, all would be fine.

I would like to give Delphi a Golden Modem award for granting SeniorNet, a group of 200 members aged 60 and older who keep in contact using hardware and software donated by Apple Computer, Inc., a senior-citizen discount—something CompuServe and The Source would not do. Well done, Delphi.

GEnie. GEnie is a favorite of *A+* magazine. Why? Because *A+* has its own Roundtable (similar to a SIG or forum) on the network. We've heard from many readers and acted on many suggestions. Now that's instant feedback.

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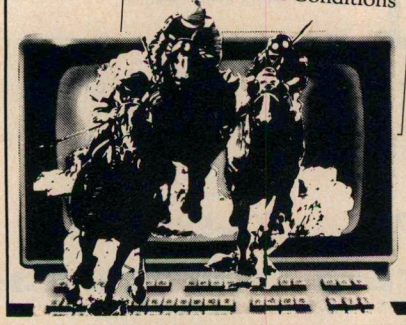

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ONLINE

The GE in GEnie stands for General Electric, which found that use of its network dropped dramatically after business hours. Some executive with foresight saw the idle infrastructure and unused capacity as a telecommunications bottle and decided to let the genie out, or, as the case may be, let the public in. Although only about a year old, and despite the half-duplex operation (other services are full-duplex), GEnie has captured subscribers because of its aggressive pricing policy.

GEnie charges $5 per hour for 300-bps or 1200-bps service during nonprime time (some access cities carry a $2-per-hour surcharge). The sign-up fee is a reasonable $18.

Pickings are rather slim at the Apple II/III roundtable compared with the other SIGs, and the bulletin-board area features cantankerous software. As a whole, however, GEnie is gaining popularity. With E-mail, games, news, conferencing, and other features, GEnie is worth a serious look.

BIX. Whereas *A+* has a roundtable on another company's network, *Byte* magazine went a step further and started its own network, Byte Information eXchange (BIX).

BIX is billed as a computer conferencing system, which means it offers more than a bulletin-board system but less than a full-fledged information service. Activities center on reading and posting messages and engaging in real-time conferences. The information is fairly technical and covers all of the major computers, languages, operating systems, and applications. If you are looking for instant technical assistance, this service is a good place to start.

BIX is accessible through Tymnet and costs $11 per hour in nonprime time and $18 per hour in prime time. Its registration fee is $25.

Mnematics Videotex. I covered Mnematics Videotex, a small company building a following through technical prowess and innovation, in detail in my December 1986 column. Suffice it to say that Mnematics operates an on-line service with all the offerings you would expect: E-mail, special-interest groups, interactive on-line chatting, electronic shopping, multiplayer games, news, weather, and other consumer-oriented services.

The company has been on-line since January 1983 and offers a good selection of SIGs (the Apple II SIG is rather sparse, however), although many of them are not as active as one would hope.

E-mail is what really sets Mnematics apart, and you can send messages to subscribers on Mnematics, CompuServe, MCI Mail, The Source, and Telex. Mnematics is so good that

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CIRCLE 202 ON READER SERVICE CARD

National Public Radio chose the company over The Source for its E-Mail service. It has tie-ins with IPSS (International Packet Switching Stream), which allow British subscribers to connect at the same price as U.S. subscribers.

Membership is $39.95, and connect charges are $4.50 an hour.

MCI Mail. As the name implies, MCI Mail handles E-mail—and very well, I might add. I have an account, *A+* has an account, and we've never had a problem transferring columns and reviews between us.

It is easy to use, with clear menus and numerous prompts. In fact, it can get too friendly, making veteran users impatient waiting for the menus to scroll by. You can opt for a command-driven structure, but that costs you an additional $10 per month.

MCI also offers a gateway feature, allowing you to send E-mail to and receive it from CompuServe subscribers. MCI's successful test link to France may bring Europe into the fold sooner than you think.

MCI Mail charges an $18-per-year membership fee. Unlike other services, it does not charge for connect time. Instead, it charges you by the letter—45 cents for messages 1–500 characters long, $1 for those 501–7500 characters long, and $1 per 7500 characters after that.

American People Link. This service started out with a bang but has hardly been heard from since. Yet, it survives and prospers, in part because of some of the lowest connect charges around. Nonprime-time access at 300 bps costs $4.25 per hour, and 1200 bps costs $4.95 per hour. In addition, the company discounts certain services to $3.49 per hour, and for the truly bargain-minded, special "Happy Hours" bring the cost down to $1.99 per hour! It has a $15 registration fee.

Like the other, smaller telecommunications services, what American People Link lacks in size it makes up for in enthusiasm. You'll find the usual array of features here: E-mail, conferencing, games, SIGs, and more. You'll find subscribers PLINKing away (engaged in conferences) or exploring ways to beat the games and win free connect time.

Database Services

Dialog. Science-fiction novels often have the main character querying a computer on some obscure topic. The computer searches through its myriad databases, and, seconds later, out comes the information. Dialog brings science fiction to your desktop with so many databases that it's either awe-inspiring or scary.

The interface is still locked firmly in the 20th century, and Dialog offers classes on how to access databases effectively. The price can top

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CIRCLE 109 ON READER SERVICE CARD

$300 per hour, but the sheer range and volume of information is worth it in the business and academic world. In addition, a home-oriented service, Knowledge Index, offers a subset of the databases on Dialog. With a $35 registration fee and $24-per-hour connect charges, it is much more reasonable for students and professionals.

The databases contain mostly abstracts of articles appearing in publications around the world. For those without access to publications containing the information you want, Dialog offers a pricey option of receiving the full-text version of the article.

Dow Jones News/Retrieval. If a company has a claim to fame for financial and business news, Dow Jones is it. Although the company is certainly not ready to abandon its flagship, *The Wall Street Journal*, it has embraced the speed of telecommunications with its News/Retrieval Service.

Stock quotes, economic indicators, investment services, financial records, earnings forecasts, SEC information, corporate news—the list goes on and on. If something occurs in the business world, you are going to find it here. Dow Jones also sells several software packages designed specifically for use with its service.

In addition, the service includes the full-text version of *The Wall Street Journal*, sports and general news, movie reviews, and weather information. The $75 registration fee is steep, as are the per-hour charges, which vary greatly depending on the service. Of course, if you make a killing in the market, you won't mind. And if you don't, the charges are probably tax-deductible.

BRS. Bibliographic Retrieval Service (BRS) competes head-to-head with Dialog in much the same way The Source competes with CompuServe. It offers a vast selection of high-priced databases to the corporate and academic world. If you used both Dialog and BRS, you would notice that many of the databases were the same, licensed from the same publisher. Like Dialog, BRS offers its own off-hours home service with greatly reduced prices that offer a substantial discount compared with Knowledge Index.

NewsNet. Some of the most interesting and valuable information comes from newsletters, publications geared to a specific topic and authored by experts. Quite often, a newsletter subscription can cost several hundred dollars per year, which is the price you pay for information and analysis.

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AT

*Requires an Apple II+, IIe, or IIc, min. 64K RAM, one disk drive. ProDOS supplied on disk. Does not function under DOS 3.3. VIDEX 80 column cards supported. Applesoft is a registered trademark of Apple Computer Inc.

CIRCLE 135 ON READER SERVICE CARD

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by Alan Bird
$74.95-for any Apple II (64K minimum)

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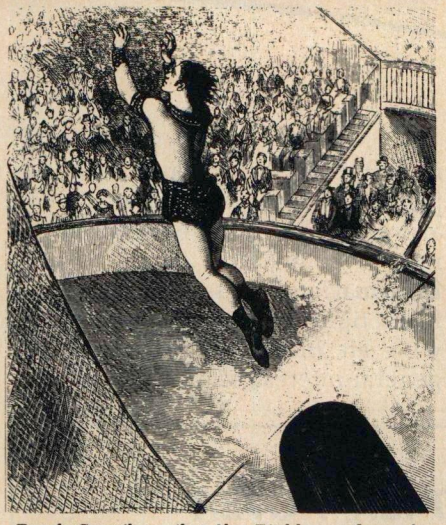

Beagle Compiler author Alan Bird leaves for work.

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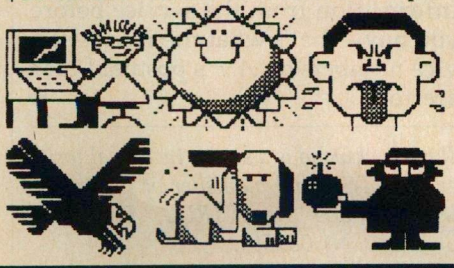

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by Mark Simonsen and Rob Renstrom
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- 40-column text
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Or, Applesoft programmers can use Triple-Dump's routines as part of their own BASIC programs.

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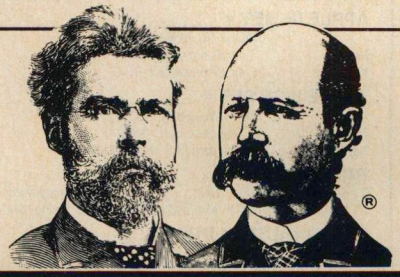

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AD #362

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these newsletters would run you into the tens of thousands of dollars.

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Information Access Company. IAC has a tight grip on the periodicals, with an indexed database to 900 general-interest, scientific, and business publications from 1983. Add a legal database with indexes to more than 730 law journals, newspapers, and other legal publications, and the Government Publications Index of the past seven years of the contents of the *Monthly Catalog of the Government Printing Office*, and you've got a one-stop service that can point you in the direction of most of the printed words of the English language. Selective, full-text retrieval is also available.

Personal Search. Canadians familiar with the *Globe and Mail* may appreciate this on-line version housing full-text articles divided into various topics. The $39.95 registration fee includes a free hour on the system. Connect charges are $120 per hour in prime time and $30 per hour in nonprime time (Canadian dollars).

EasyLink. Western Union's EasyLink should be considered a hybrid network/database. On the one hand, it offers E-mail in the U.S. and to overseas. On the other hand, it provides low-cost access to more than 700 databases. EasyLink has a registration fee of $25 per year. E-mail costs as little as 35 cents a message (a short message).

Gateway Services

Tymnet, Telenet, and Datapac. All three services function as a gateway to networks and databases. Tymnet and Telenet primarily serve the U.S., and Datapac serves Canada. They are transparent; that is, they do not interfere with your searching and communicating. All information services provide detailed instructions in their users' guides on how to access their network or database via these gateways.

The capsule descriptions above provide enough detail to enable you to select those that satisfy your telecommunications needs. As with any other purchase, you should obtain information from the service before you buy—that's what the reader-service numbers on *A+*'s postpaid card are for. ✚

Russ Lockwood is a senior technical writer for AT&T and publisher of the newsletter Space Race *(RD1, Box 307, Stockton, NJ 08559).*

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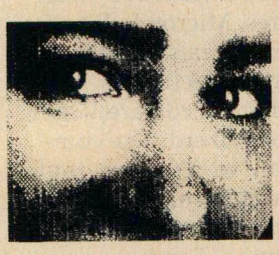

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*Any parallel printer interface for Apple computers from Orange Micro, Apple Computer, Apricorn, Interactive Structures, Microtek, Practical Peripherals, Quadram, Street Electronics, Texprint, Thirdware, Tiger and Wizard.

CIRCLE 108 ON READER SERVICE CARD

PICK OF THE CROP *BY LISA RALEIGH*

Sound, science, a system saver, and sundry selections of interesting products for you and your Apple, too.

PRODUCT SPOTLIGHT

GRAPPLING WITH GRAPHICS

ProGrappler, the successor to Orange Micro's popular Grappler+, is a print-enhancement add-on board with lots of tricks up its sleeve. It works with parallel printers and is especially designed to take advantage of the Apple IIGS. For instance, the ProGrappler includes a Screen Shot desk accessory to let you grab a printout of the screen with just a couple of clicks of the mouse. It also includes windowing and sizing functions to let you play with pictures and get them just right before you print them out.

On other Apple II computers, the ProGrappler also lets you print high-resolution images, and you can rotate and reverse graphics, set footers and headers, automatically number pages, select printer typestyles, and use pull-down menus to specify commands.

The ProGrappler has compatible software that works with the Grappler+. In fact, Orange Micro is offering an upgrade path for owners of its older parallel-interface products. To upgrade to the ProGrappler, send in your interface card and cable along with $55 plus $7.50 shipping and handling. Orange Micro also extends this offer to owners of parallel interfaces made by the following companies: Apple, Apricorn, Interactive Structures, Microtek, Practical Peripherals, Quadram, Street Electronics, Textprint, Thirdware, Tiger, and Wizard. The company won't accept trade-ins of no-name cards or Grappler counterfeits, though. Send your trade-in to ProGrappler Upgrade Offer at the address below. *(List Price: $119)*

Requires: Apple II Plus, IIe, or IIGS

ProGrappler
Orange Micro
1402 North Lakeview Avenue
Anaheim, CA 92807
(714) 779-2772

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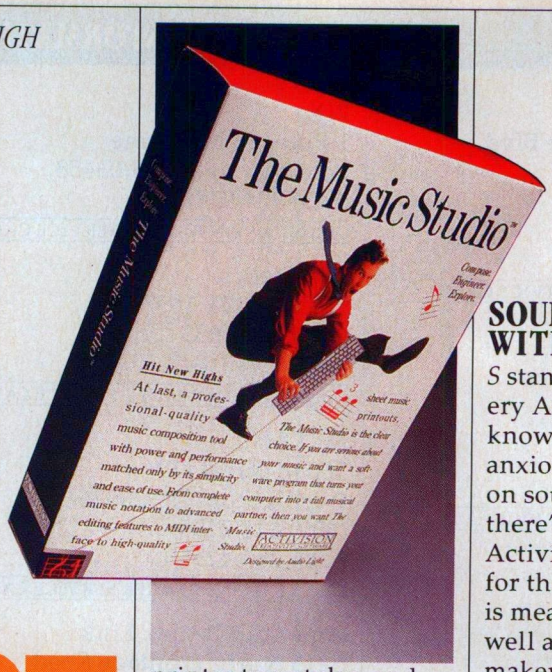

SOUND IT OUT WITH THE IIGS

S stands for sound, as every Apple IIGS owner knows. For IIGS owners anxious to get their hands on sound investments, there's now a version of Activision's Music Studio for the IIGS. Music Studio is meant for beginning as well as advanced music makers. It lets you compose music by placing notes on a score sheet and then playing back your composition. Music Studio includes 45 predesigned instruments and voices but also allows you to create your own sounds. A built-in "sound editor" lets you fine-tune instruments so that you get exactly the sounds you want. Compositions may include as many as 15 channels at once. For beginners (especially for young children), a "music paintbox" lets you place colored dots, rather than notes, on the score sheet so you don't have to worry about what type of note to use. Instead, novices can concentrate on experimenting with sounds. Music Studio works with the Passport Designs, Inc., MIDI card and the SuperSonic Stereo Card from MDIdeas. *(List Price: $79.95)*

Requires: Apple IIGS, 512K RAM, 3.5-inch disk drive

Music Studio
Activision, Inc.
2350 Bayshore Parkway
Mountain View, CA 94043
(415) 960-0410

CIRCLE READER SERVICE NO. **405**

HOMEWORKER HELPER

There are still a couple months left before summer vacation—and that means a couple more months of homework and term papers. To give students a hand, Davidson & Associates has brought out Homeworker, a multifunction product for writing papers, preparing flash cards, performing calculations, and tracking due dates and grade-point averages. Homeworker's word-processing component includes an outlining function. The flash-card maker lets students prepare for tests that require memorization, and the built-in calculator includes a handy table that automatically converts measurements. There's also a calendar to help organize activities and assignments, and a section in which students can keep track of their grades and see how a *B* on that upcoming geometry final might affect their overall G.P.A. Homeworker is intended for high-school and college students. *(List Price: $89.95)*

Requires: Apple IIc or IIe with Extended 80-Column Card

Homeworker
Davidson & Associates, Inc.
3135 Kashiwa Street
Torrance, CA 90505
(213) 534-4070

CIRCLE READER SERVICE NO. **406**

USE POWER WISELY

PurePowerPlus not only protects your computer and peripherals from power surges, spikes, and line noises but also provides current- and voltage-usage indicators to warn you if you are about to exceed the power limit. PurePowerPlus fits between the monitor and the computer and serves as a swivel base for the monitor. It has six individual switches and a master switch to power up or shut down your system and its peripherals. The unit automatically checks through all your system's circuits and components to detect any power-line problems and has red (warning) and green (OK) indicators that let you know when the power-surge-protection circuit is operative. Other features include six power outlets, a master on/off switch, steel construction, and a front-panel static discharger. *(List Price: $189)*

PurePowerPlus
SSB Design
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Irvine, CA 92714
(714) 261-6855

CIRCLE READER SERVICE NO. **407**

MULTIBOTICS ON THE MARCH

Turn your Apple into a robotic control system, say the folks at Access Software, Inc. Access has just released an Apple IIe version of its Multibotics MB230 "robotics workshop," a package that lets you control numerous experiments with your IIe. The kit comes with a special interface device that connects the IIe with mechanical marvels you build yourself with components included in the kit. The users' guide contains instructions for more than 50 projects, but Access hopes its customers won't stop there and will dream up even more imaginative projects. *(List Price: $169.95)*

Requires: Apple IIe, 64K RAM

Multibotics MB230
Access Software, Inc.
2561 South 1560 West
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(801)298-9077

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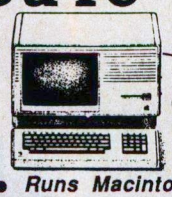

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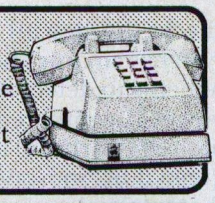

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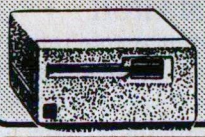

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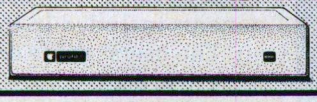

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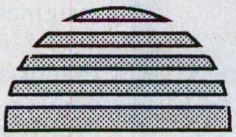

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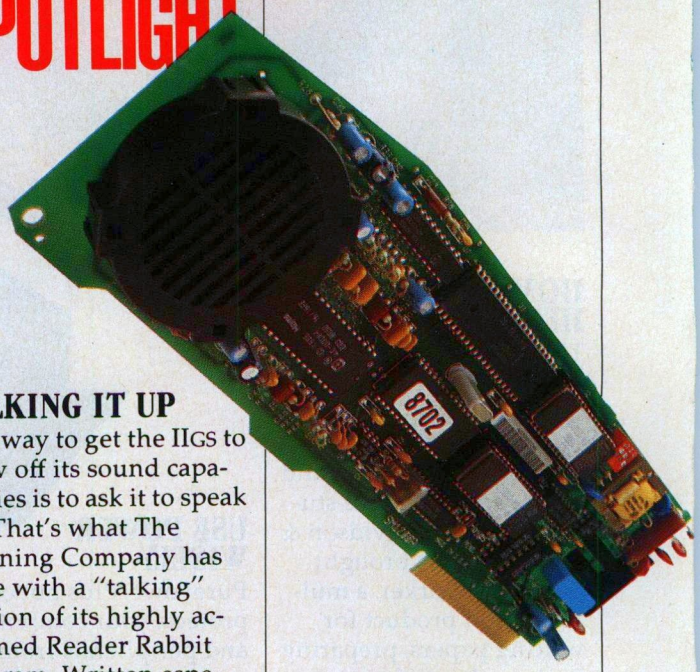

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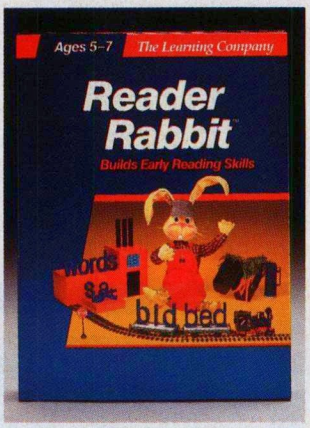

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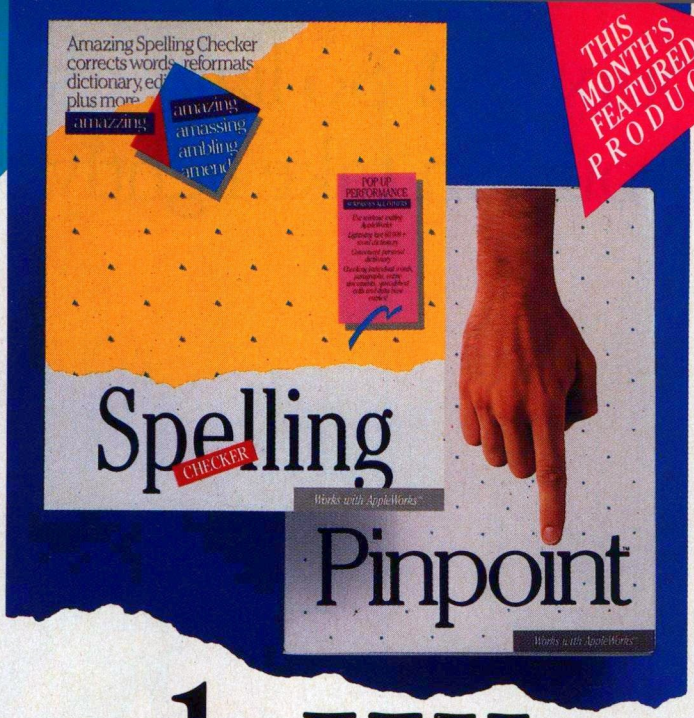

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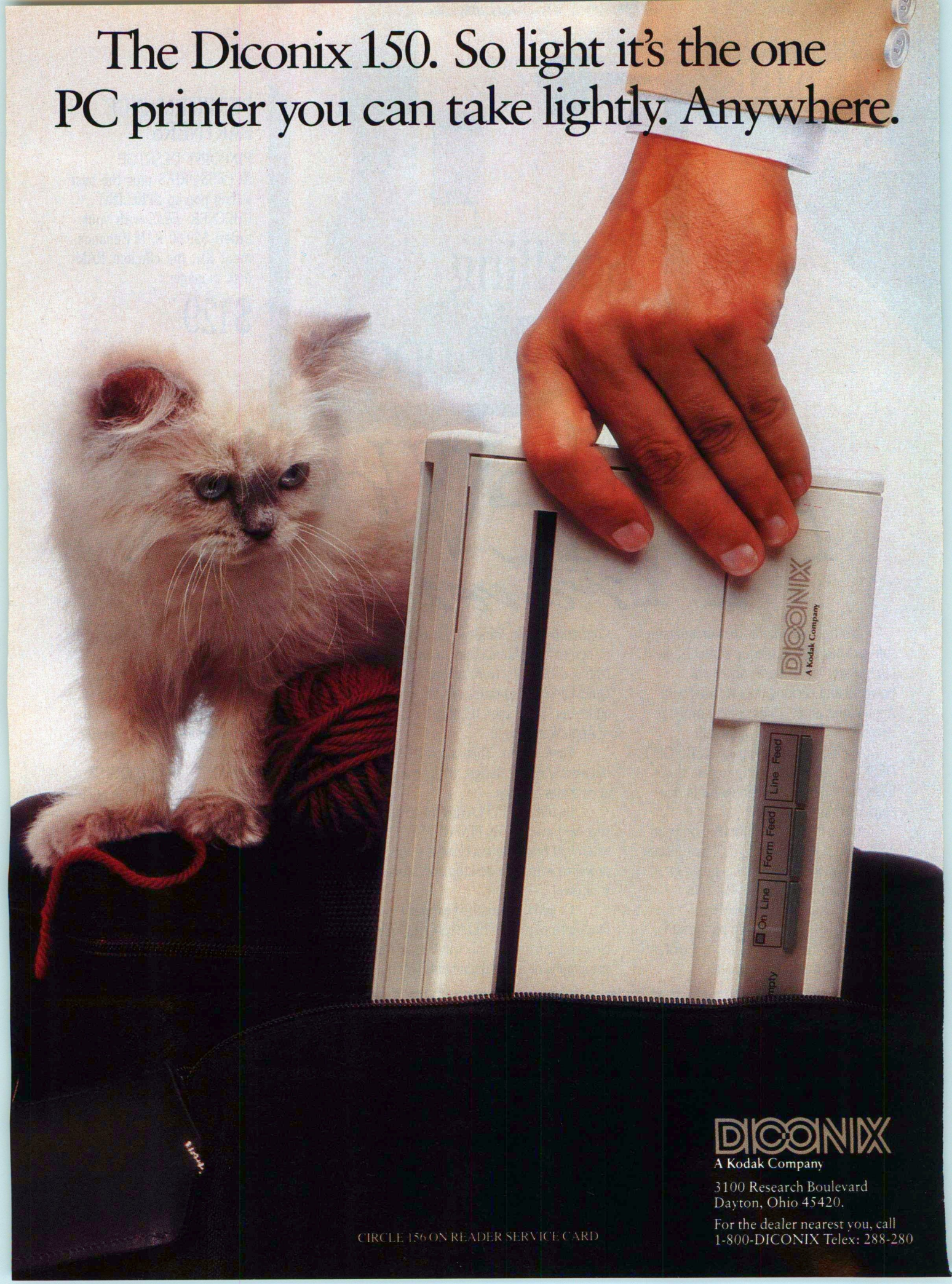

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A+ APPLEWORKS REPORT

This month's AppleWorks Report serves up a menu of macro programs—Super MacroWorks, AutoWorks, and KeyPlayer.

FEATURE REPORT *BY CHRISTOPHER VAN BUREN*

MACRO MANIA

The latest craze in AppleWorks add-on products is macros. Six months ago "macro" was a term you'd find primarily in the Lotus 1-2-3 world. Today, AppleWorks users are collecting and programming hundreds of macro files to add power to AppleWorks.

Just what does a macro product do? In short, it lets you reduce any series of keystrokes in AppleWorks (including the Command key) down to a single-key AppleWorks command. By typing the macro command, you're essentially issuing all the keystrokes collected in it. A simple macro might automatically enter your name and address into a word-processing file. Just type the macro command (such as solid-apple/N), and the entire name and address appears as if you'd just typed it yourself—except much faster. A more complex macro might automatically enter certain information into a spreadsheet, calculate new values, and then print a specific area of the spreadsheet. Another macro might store all the command sequences you need to set specific page margins in the word-processing module.

Macro power is almost a must for AppleWorks users, and you have the luxury of selecting from these three excellent macro programs: Super MacroWorks from Beagle Bros., AutoWorks from the Software Touch, and KeyPlayer from Pinpoint. All these programs are worth recommending, but they have some differences, both in style and in features.

Macro Concepts

Let's first cover some common ground. All macros work with solid-apple-key commands that you specify when you create the macro. You can set up one macro, for instance, to be invoked by the solid-apple/C command and another by solid-apple/R. Because each macro is associated with its own command, you can have several macros available at the same time. The three macro programs we're looking at here differ in the number of macros you can have available at once, but each of them lets you combine the solid-apple key with letters and numbers to create many macro commands.

Furthermore, each of the macro programs lets you construct macros in two ways. One way is to record your keystrokes right from the keyboard as you enter them and then play them back at any time by invoking the macro command you've specified. The other way is to create a macro file using a special macro language that consists of keyboard "tokens." These tokens represent keys and actions on the keyboard (e.g., <SPACE> for a press of the space bar). You enter the Apple-

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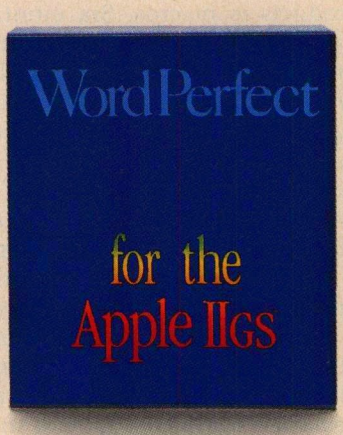

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Works word-processing module and create each macro by typing the tokens you need.

The programs can turn the resultant document into a set of working macros by compiling it, a process that resembles programming. You have to know which specific tokens are equivalent to which keystrokes and enter them into the document correctly. If you've made a mistake, a compilation error occurs—just as in Pascal programming. For obvious reasons, you'll find the "auto-record" method much easier than typing macro tokens, and anyway the programs let you store recorded macros in "token form" as word-processing documents. If you want, you can view them in the word-processing module, change them, and restore them.

Although only one word-processing document can be compiled and active at a time, you can store as many of them as you like. Thus, you can collect macros into groups and use the group that is most appropriate at any time. Additionally, you can specify in which module (or modules) a macro will be active; some may be for use in the word-processing module, others in the database module, for example.

Macro programs require that you "patch" your AppleWorks disk, meaning that they become part of AppleWorks itself, which makes them fast and easy to use. Unfortunately, many add-on products for AppleWorks also require that you patch the program—and patches of different types don't always work together. Often, you have to patch and repatch AppleWorks in order to get certain products to recognize each other.

Super MacroWorks

Super MacroWorks is an enhanced version of MacroWorks, the first AppleWorks macro program to appear. Because Super MacroWorks is so superior to MacroWorks, I'll concentrate only on it. You should know, however, that Super MacroWorks works only with Version 2.0 of AppleWorks and that MacroWorks works only with the pre-2.0 versions.

Super MacroWorks is the most feature-packed of the three macro programs under discussion here. It contains dozens of special functions, divided into three types, that you can use in your macros. Ten of these functions are called "reserved macros" because you can invoke them by typing specific keystrokes, whether or not you are running the macro program. In other words, these ten functions are available within AppleWorks—just like having more AppleWorks commands. Since they are always active, you cannot name a custom macro with one of the ten reserved macro names. For example, press solid-apple/' and you get the current date in this format:

November 11, 1986

Other reserved macros include the ability to find any filename when selecting files from disk (especially useful for your custom macros) and the ability to jump to the blank spaces between words (useful in the database module, where you can't otherwise jump between words).

In addition to the ten reserved macros, Super MacroWorks has spe-

	Super MacroWorks	AutoWorks	KeyPlayer
Compatibility with AppleWorks versions	2.0	all	all
Compatibility with other programs	none	Pinpoint	Pinpoint[1]
Maximum length of a single macro (number of keystrokes)	4000	5000	3000
Maximum length of all active macros combined (number of keystrokes)	4000	5000	3000
Number of macro keys active at one time	258[2]	100 plus	70
Number of built-in functions (reserved macros)	10	0	1
Macros operated from menu		■	■
Record mode	■	■	■
Special functions accessible in Record mode	■		■
If/then/else logic	■	■	■ [3]
Uppercase/lowercase text conversion	■	■	
Date and time formats	■	■	■ [4]
Reads single-character input from keyboard	■	■	■
Reads multicharacter input from keyboard	■	■	■
Can link files	■		
Can print user prompts	■		■
Can tell whether Insert or Edit cursor is active	■	■	
Can read characters from the screen	■		
Dumps the contents of a line to the printer	■		
Compilation errors displayed in context			■
Can create lists in a macro for user selection			■
Can find specific files in a directory	■		
Clock support	■	■	■
Mouse support	■	■	
Auto-start-up macros	■	■	

1. KeyPlayer is also compatible with Point-to-Point, Apple Writer, Word Perfect, and BASIC.
2. 56 for each of the modules
3. KeyPlayer's else logic is more powerful than that of the others.
4. KeyPlayer offers more formats than the others.

```
File: Pseudo Soft              REVIEW/ADD/CHANGE              Escape: Main Menu
=====|====|====|====|====|====|====|====|====|====|====|====|====|====|====|===
start

  -- List Command --
l:<awp><if>L<right><if>I<right><if>S<right><if>T<right>
<rtn><rtn>10 FOR I=1 TO 10<rtn>20 PRINT SPC(I*10);I<rtn>
30 NEXT I:END<rtn>@<left>'

  -- New Command --
n:<awp><if>N<right><if>E<right><if>W<right>
<insert><oa-e><oa-f>m1<rtn>n<down><oa-d><oa-9><rtn><zoom>
<oa-o>cn<rtn><esc>PSEUDO - SOFT 1.0<rtn>COPYRIGHT BEAGLE BROS, 1986<rtn>
<oa-o>uj<rtn><esc><rtn>@<left>'

  -- Catalog Command --
c:<awp><if>C<right><if>A<right><if>T<right>
<menu><sa-0>5<Rtn>2<Rtn><input><resume><sa-0><rtn>@<left>'

  -- Load Command --
g:<awp><if>L<right><if>O<right><if>A<right><if>D<right>
<sa-ctrl-s><sa-ctrl-g><swap><menu><sa-0><swap><rtn><rtn><find><rtn>
--------------------------------------------------------------------------------
Type entry or use @ or  cmds          Line 24  Column  1        @-? for Help
```

Figure 1: Super MacroWorks custom macros. Notice the If function in the macros; it tests whether or not a given character matches the criteria the macro specifies.

cial functions for recording custom macros. Many of these functions add powerful programming-like abilities to your macros (see figure 1). For example, the If function tests whether or not a given character matches criteria you've specified. If so, the macro continues; if not, the macro stops. Other functions let you evaluate information that has been typed from the keyboard and act on that information. The List function lets you run a macro several times; each time the macro uses a different item from the list you created for the function, which comes in handy for simulating random numbers.

Worthy of special note is the Increment function, which changes the character at the cursor position to the next letter in the alphabet, or the next whole number. For example, an *A* becomes a *B*, and a *1* becomes a *2*. The Decrement function has the same effect but in the opposite direction. Used with the logic functions, these commands can change any number to any other number under given conditions.

You can incorporate these special features into your custom macros by simply entering their corresponding solid-apple commands while recording a macro. Super MacroWorks gives you 49 of these functions.

In the ease-of-use department, Super MacroWorks comes out a little behind the other two macro programs. Because of all the special functions and the difficult-to-remember keystrokes that invoke them, the program can take some time to learn. Also, macro files can be complex and difficult to debug. Super MacroWorks does not show macro errors in context when you're compiling a macro file, but it does have a single-step mode that lets you run a macro step by step. If errors exist, they will certainly turn up in this kind of slow motion.

A macro lets you reduce a series of keystrokes in AppleWorks down to a single-key AppleWorks command.

You'll definitely need the manual for Super MacroWorks. Thankfully, Beagle Bros. did an excellent job on its documentation.

Super MacroWorks comes with some handy bonus programs. One of them lets you personalize the AppleWorks help screens. If you find that you rarely need the help screens, this program lets you replace them with something of your own. You'll probably want to use this feature to display a list of the Super MacroWorks functions. Another bonus program is a simple program selector that lets you see all ProDOS system files in a menu after quitting AppleWorks. You can run any of the system files by simply selecting them from the list. Super MacroWorks also includes a mouse interface for AppleWorks.

AutoWorks

AutoWorks was the second macro product to hit the market, after the original MacroWorks, and the first to introduce "if/then/else" logic to macros. It also offers many function commands and the ability to load and compile macros right inside of AppleWorks. Since AutoWorks' introduction, the other macro products have also incorporated these features.

AutoWorks is slightly easier to use than MacroWorks because of its handy macro menu. Installing AutoWorks is a breeze, and you can even use it with the Pinpoint accessories. To use both products, however, you must have a memory-expansion card that works in the auxiliary slot of your IIe. Unlike Pinpoint's own macro program, KeyPlayer, AutoWorks can be used while Pinpoint accessories are active. After you've installed AutoWorks on your AppleWorks disk, pressing solid-apple/X calls up the AutoWorks menu (see figure 2).

The Record Macro command asks you for a macro name and then begins recording your keystrokes. Everything you type is stored until you press solid-apple/ X again. To store a recorded macro permanently on disk, use the List command in the word-processing module. It lists the macros you've recorded and named (in token version) into a word-processing document that you can save to disk. You can use a prerecorded macro file by loading it into the word-processing module and using the Update Macro command, which compiles the macro file and makes it the active set of macros.

When recording macros, you have several special functions at your disposal. AutoWorks calls its

functions keywords. One function that does not appear in the other products is the keyword SUB, which lets you redefine the keys on the keyboard, substituting any character for any other character.

AutoWorks' functions do not have keyboard equivalents, so you have to enter them into the word-processing version of a macro, which complicates adding special functions to your custom macros. AutoWorks comes with sample macro files that you can use right away, but the manual could use more detail regarding the special functions.

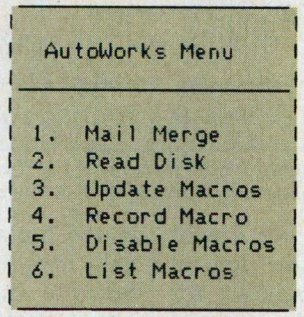

Figure 2: The AutoWorks menu

The AutoWorks program has more than just macro power. It comes with some extra features that make it an excellent value. One is a well-written mail-merge feature for AppleWorks that is useful for pre-2.0 versions of AppleWorks. (AppleWorks 2.0 has mail-merge built in.) It appears on the AutoWorks menu when you press solid-apple/X. Another bonus program reads ProDOS disk directories into the AppleWorks database after you issue the appropriate command on the same solid-apple/X menu. After reading several disks into the database module, you can print sorted listings of all your files. When AutoWorks is installed on your AppleWorks disk, you get built-in mouse capabilities as another bonus.

KeyPlayer

KeyPlayer is from Pinpoint, famous for its AppleWorks desktop accessories. In fact, KeyPlayer is a desktop accessory—one of its biggest advantages over the other two programs. Because it's a Pinpoint accessory, it works with the other Pinpoint accessories. If you already own Pinpoint accessories, KeyPlayer is easy to add to the list. If you don't already have Pinpoint accessories, you'll need to get them if you want to get KeyPlayer, because KeyPlayer requires the installation disk that comes with the basic accessory kit.

This requirement makes KeyPlayer the most expensive of the macro programs. On the other hand, KeyPlayer is the only macro program that incorporates the interaction of the Pinpoint accessories. Like the other accessories, KeyPlayer works with programs other than AppleWorks, including Apple Writer, Word Perfect, BASIC, and all of Pinpoint's stand-alone products. Integration and expandability are the biggest advantages of KeyPlayer (and Pinpoint products in general).

The only disadvantage of KeyPlayer's accessory status is that the program takes up to 15 seconds to load from disk when you call it from the accessory menu. Once loaded into RAM, KeyPlayer compiles and runs macros quickly, and if you use the program with a RAMdisk or accelerator card, speed is not a problem. KeyPlayer is still the slowest of the macro programs, however.

Installing KeyPlayer is fairly straightforward. Just copy the KeyPlayer accessory file to the disk containing the other accessories (your AppleWorks disk, if it has the capacity) and then update the installation disk and install Pinpoint onto a fresh copy of your AppleWorks start-up disk. All the accessories will appear in a pop-up menu when you press solid-apple/P.

You have the luxury of selecting from these three excellent macro programs.

When you select KeyPlayer from the list of accessories, you enter the Macro mode, where all other accessories are blocked from use. Pressing solid-apple/P no longer brings up your Accessory list; rather, it brings up the KeyPlayer main menu. Like the AutoWorks menu, this menu lets you load existing macro files from

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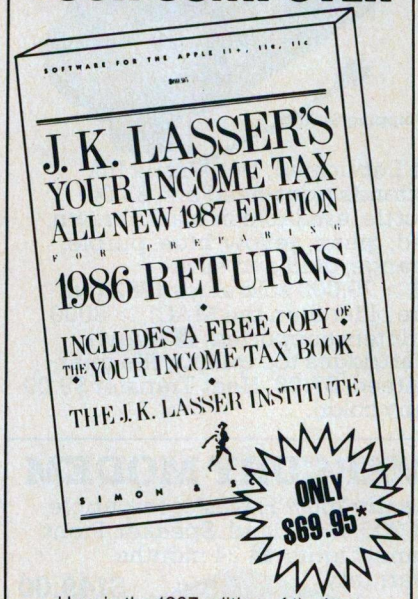

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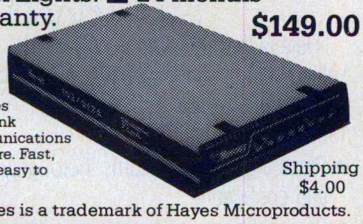

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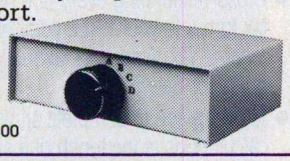

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disk, compile macro files, record new macros, disable macro keys, and store new macro files onto disk. It also has an option for quitting the Macro mode and returning to the other desk accessories.

This macro menu earns KeyPlayer good marks in the ease-of-use department, but KeyPlayer goes even further. One of its most convenient features is its control panel (see figure 3).

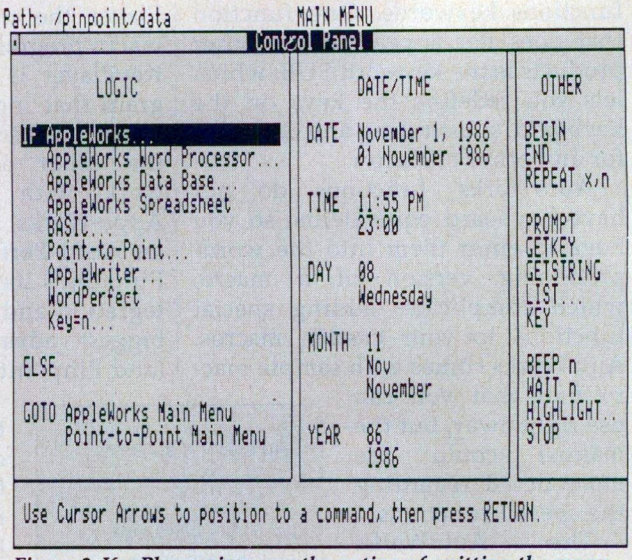

Figure 3: KeyPlayer gives you the option of quitting the macro mode and returning to the other desk accessories.

The control panel is accessible from the KeyPlayer menu and contains all the logical and special functions available for your custom macros. Instead of memorizing strange commands to invoke special functions within a macro, simply call up the control panel and highlight the desired function. KeyPlayer has slightly more than 30 special functions, compared to Super MacroWorks' 49 and AutoWorks' 25. (See the comparison chart included in this article for details about the functions each of these products offers. You'll find that each of them has at least a few functions the others don't.)

Pinpoint added some important extras to KeyPlayer for serious macro makers. For example, macro listings in the word-processing module are in hierarchical form: Branched statements are indented for easier debugging. KeyPlayer is also the only program that displays compilation errors in context. Finally, Pinpoint lets you view all available macro files by using the Load command on its main menu. You can immediately load and compile any of the files.

KeyPlayer offers a few original functions, including one that pauses a macro for a chosen number of seconds from 1 to 255 and another that automatically highlights a chosen range of cells of a spreadsheet.

KeyPlayer comes with a sample macro file and a well-written manual. The program also shows you how to convert AutoWorks and MacroWorks (but not Super MacroWorks) macros to KeyPlayer macros. The same procedures can be translated so that Super MacroWorks and AutoWorks can convert other macro files to their formats. ✚

Christopher Van Buren is editor of the Q-mar group's AppleWorks Exclusive Reference *newsletter.*

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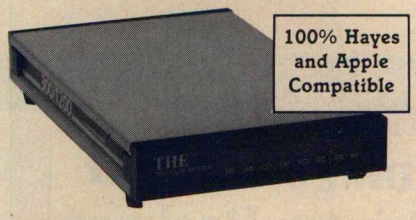

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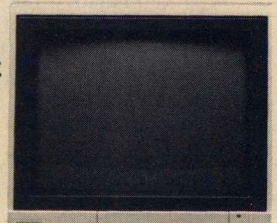

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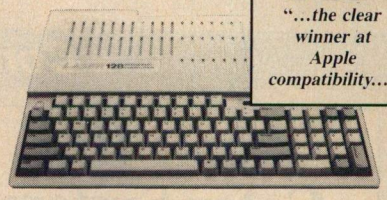

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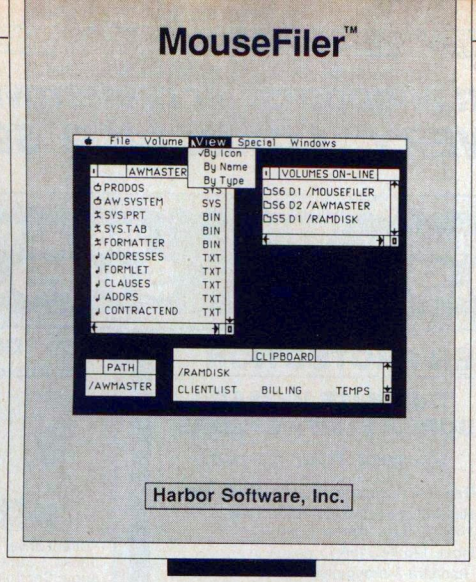

Quick Take

BY KEN GOEHNER

MouseFiler

A file- and directory-management utility program for the IIe and IIc

Mouse technology is not all that new; it has been around for at least 15 years. The Apple Macintosh is unquestionably the machine most responsible for bringing the mouse to public attention as an effective input device, and several companies have started working mice into their computer designs. Apple Computer has enhanced its success in the home and education markets by introducing the mouse option to the Apple IIe and IIc, first as an input device and game controller and then as a way of manipulating the cursor in word-processing and spreadsheet programs.

That was good for a start, but as Macintosh software advanced, so did the demand for mouse-driven Mac-style software for the II series. Enter Harbor Software and its magnificent MouseFiler.

MouseFiler is a file- and directory-management utility program. It allows you to use the AppleMouse II to open and close windows and activate pull-down menus. MouseFiler works with any volume (information-storage space) that the ProDOS operating system can recognize as a disk: 5¼-inch Apple disk drives, 3.5-inch UniDisk drives, ProFile hard-disk drives, and RAM cards that simulate disk drives.

To those mouseless or new to microcomputers the above paragraph may sound a bit obscure. In essence, a directory-management utility program makes it easy to catalog and move information. As far as volumes, disks, and RAM go, the odds are that if your Apple storage system works now, it will also work with MouseFiler.

MouseFiler may sound confusing, but it's not. Once installed, it allows your Apple IIc or IIe (with 128K RAM) to mimic the standard Macintosh functions that facilitate the creation and display of directories. It also lets you quickly and easily select programs and text files (see figure 1). MouseFiler also provides an easy way to format disks, copy files and entire disks, compare files and disks (to determine whether copies are identical or not), and detect and locate bad "blocks." (A block is an area on the disk where specific information is stored; a bad block is somewhat similar to the place on your favorite record album where the needle always skips.) MouseFiler can also act as a "switcher," allowing you to go from one program to another without restarting your computer.

TXT	Text File
BIN	Binary file
DIR	Directory
ADB	AppleWorks database file
AWP	AppleWorks word processing file
ASP	AppleWorks spreadsheet file
PAS	Pascal file
CMD	ProDOS command file
INT	Integer BASIC file
IVR	Integer BASIC variables file
BAS	Applesoft file
VAR	Applesoft variables file
REL	Relative object file
SYS	System file

Any other file types encountered are displayed in their hexadecimal (base 16) format as "$xx" where xx = the hexadecimal number.

Figure 1: A list of file types recognized by MouseFiler

Essentially, MouseFiler is an excellent tool for dedicated Apple II users. It provides a fast and convenient way to manipulate programs and files without typing, while providing some handy software-diagnostic tools at the same time. Whether MouseFiler can benefit casual Apple users is difficult to say, but then again programs such as MouseFiler often cause individuals to change from computerphobe to computermaniac. For the price, you can't afford not to try it. ✚

Ken Goehner is a San Francisco Bay Area free-lance writer who specializes in Apple products.

PRODUCT INFORMATION

MouseFiler
Harbor Software, Inc.
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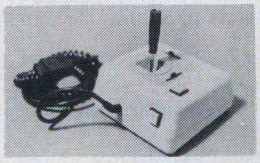

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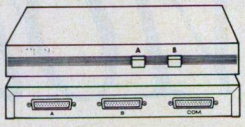

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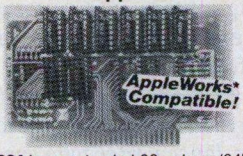

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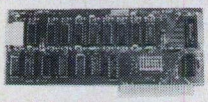

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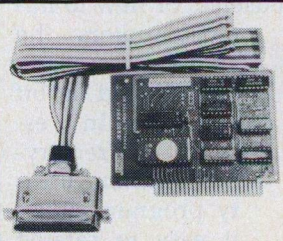

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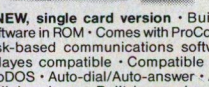

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CIRCLE 279 ON READER SERVICE CARD

SOUND SAMPLER

A program that lets you play with pitch changes

Our first sound-demonstration program in January showed how to create simple melodies on the Ensoniq chip. This month's program allows you to alter the pitch of an audio signal by playing it back through that chip. By changing the pitch, you can disguise your voice!

The program controlling the Ensoniq chip is written in machine code and is contained in data statements within the following BASIC program listing. The BASIC program pokes in the machine code and executes the machine code with the appropriate parameters set. The call in line 50 sets the number of oscillators, which oscillator, the frequency, and the volume. The call in line 60 makes the machine-code program start continuously sampling sound until you press the space bar; then the program continues to line 70 and makes the oscillators quiet. The sound samples are stored directly into the Ensoniq waveform RAM in a one-page (256-byte) waveform table. The Ensoniq DOC plays back the data at its own constant frequency while the machine-code program is storing new waveform data into the same buffer. We simply request the Ensoniq chip to play back the waveform data at a different frequency.

```
5     REM //GS Ensoniq sound sampler by
      Roland Gustafsson
10    SS = 2: POKE 0,SS * 16
20    SO = 768: FOR A = SO TO SO + 190:
      READ B: POKE A,B:
      C = C + B: NEXT
30    READ A: IF A <  > C THEN  PRINT
      "Error in DATA statements!": END
40    NO = 31:OS = 0:FQ = 451:VL = 240:SR
      = 2
50    CALL SO,NO,OS,FQ,VL
60    CALL SO + 3,SR
70    FOR A = 0 TO 31: CALL SO,31,A,0,0:
      NEXT
80    PRINT : PRINT "Current frequency = "
      FQ
90    INPUT "New frequency ? (1-9999) ";FQ
100   GOTO 50
1000 DATA 76,6,3,76,118,3,175,202,0,225
1010 DATA 9,64,141,60,192,160,0,140,63
1020 DATA 192,140,62,192,169,128,141,61
1030 DATA 192,200,208,245,175,202,0,225
1040 DATA 141,60,192,32,76,231,169,225
1050 DATA 141,62,192,138,10,141,61,192
1060 DATA 32,76,231,134,58,32,190,222
1070 DATA 32,103,221,32,82,231,72,187
1080 DATA 169,0,32,109,3,250,169,32,32
1090 DATA 109,3,32,76,231,169,64,32,109
1100 DATA 3,169,128,162,0,32,109,3,169
1110 DATA 160,32,109,3,169,192,32,109,3
1120 DATA 32,183,0,208,154,96,5,58,141
1130 DATA 62,192,142,61,192,96,165,0,9
1140 DATA 128,141,154,3,32,76,231,142
1150 DATA 146,3,160,0,175,202,0,225,141
1160 DATA 60,192,169,226,141,62,192,162
1170 DATA 2,202,208,253,173,61,192,141
1180 DATA 160,192,208,2,9,1,170,175,202
1190 DATA 0,225,9,64,141,60,192,169,0
1200 DATA 141,63,192,140,62,192,142,61
1210 DATA 192,200,44,0,192,16,202,44,16
1220 DATA 192,96,21805
```

Program Description

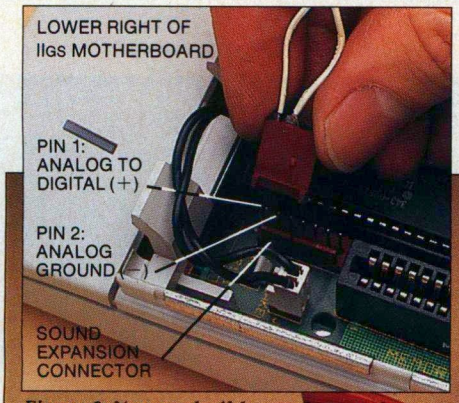
Line 10: Sets the slot number of the SuperSonic Digitizer (if you are not using the SuperSonic Digitizer, do not change line 10)
Line 20: Pokes in the machine code
Line 30: Verifies that the machine-code data statements were typed in correctly
Line 40: Initializes the parameters that are passed to the machine code
Line 50: Calls the machine code to start the oscillators
Line 60: Calls the machine code to begin continuously sampling sound
Line 70: Calls the machine code to make the oscillators quiet
Line 80: Allows you to enter a new frequency value (larger numbers correspond to higher frequencies)
Line 100: Loops back to try new frequency
Line 1000–1220: Machine-language program in Data statements

Description of Variables (Range)

NO = number of oscillators to activate, minus 1 (0–31)
OS = which oscillator to use (0–31)
FQ = value used for Ensoniq frequency register (0–65535)
VL = volume (0–255)
SR = sample rate (2–255)

Try this: Make your voice play back in three-part harmony. Duplicate line 50, creating lines 51 and 52, but change the oscillator, frequency, and volume variables. ✚

Roland Gustafsson is a free-lance programmer and a renegade hacker.



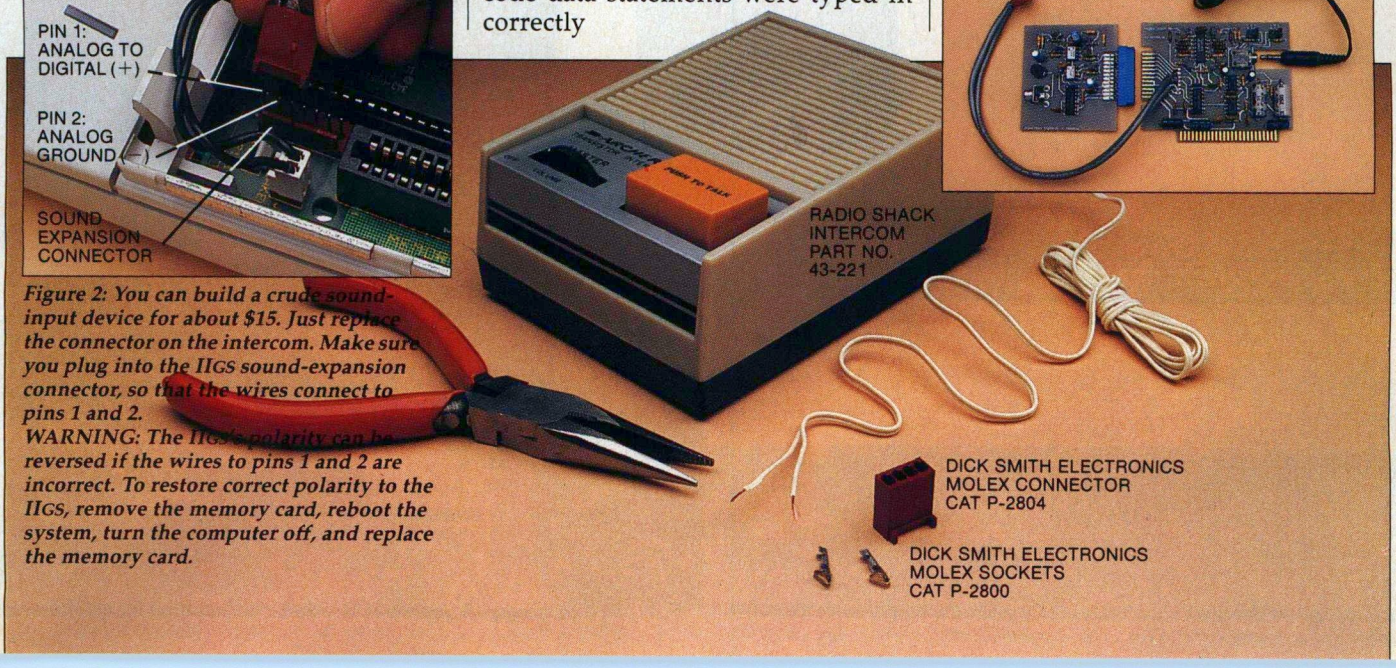


Figure 2: You can build a crude sound-input device for about $15. Just replace the connector on the intercom. Make sure you plug into the IIGS sound-expansion connector, so that the wires connect to pins 1 and 2.
WARNING: The IIGS's polarity can be reversed if the wires to pins 1 and 2 are incorrect. To restore correct polarity to the IIGS, remove the memory card, reboot the system, turn the computer off, and replace the memory card.

Figure 1: The SuperSonic stereo card with the Digitizer card from MDIdeas lets you input any standard audio sounds for about $100. You can sample sound from your television, CD player, radio, tape recorder, or musical instruments.

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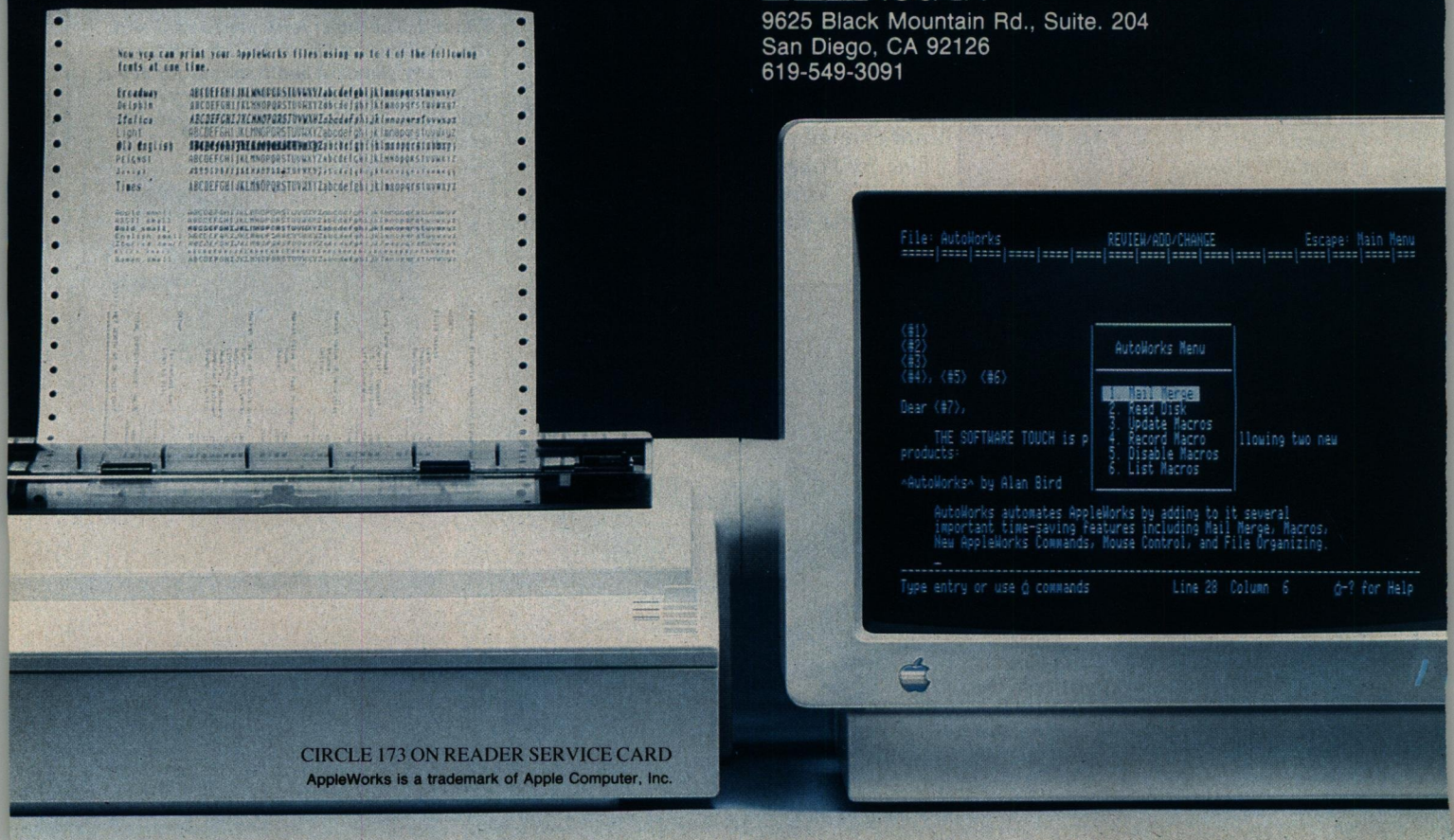

CIRCLE 173 ON READER SERVICE CARD

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BY ROBERTA SCHWARTZ AND MICHAEL CALLERY

DOUBLE-HI-RES ANIMATION

And some pitfalls of using IIGS software with the Apple graphics tablet

Many of you have told us how much you enjoy working with Dazzle Draw, so we know you'll be delighted to hear about Animate, the first double-hi-res animation package for the Apple II. But first, we've got a few things to report about our experiences with the Apple IIGS.

Here's the Good News: We were delighted to discover that the old faithful Apple graphics tablet works with the GS. We put the interface card into slot 7, and every older program that we've always used it with (Designer's Toolkit, Complete Graphics System, Dazzle Draw, and so on) has performed OK.

Here's the Not So Good News: First, we're quite sure that graphics programs developed expressly for the Apple IIGS won't work on the Apple tablet.

Second, at the time of this writing (late December), there's only one GS graphics program available: Paintworks Plus. Although we won't be giving you a full report about this color MacPaint-lookalike until our next column, we want to caution you now about a couple of problems we're having with it. Sticking to the subject of tablets, it seems that having the Apple graphics tablet in slot 7 sends Paintworks Plus into a tizzy. Strange things happen when the program tries to load. We know this behavior is due to a software problem, because we've been using a prototype version of Baudville's 8/16 paint for the GS, and although it doesn't work with the Apple tablet either, the program works around it just fine.

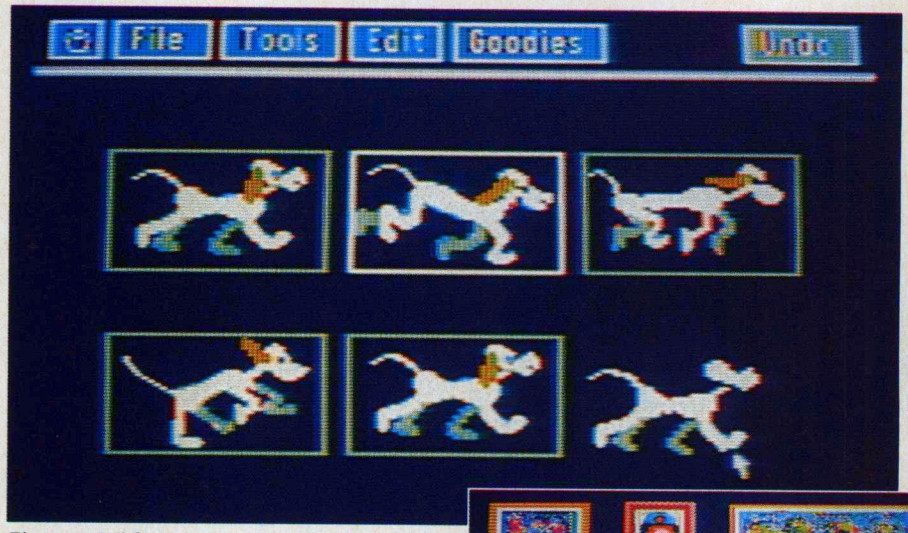

Figure 1: With Animate, as with other animation software, you start by drawing one object and then draw a series of variations of it—except Animate lets you do it all in double hi-res.

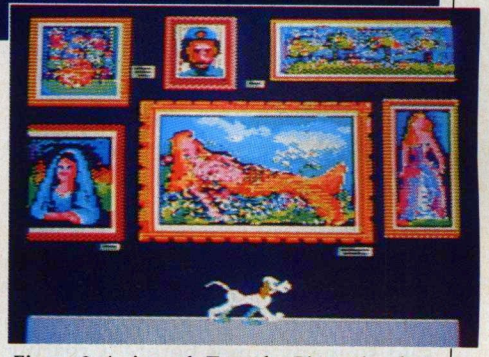

Figure 2: Animate's Transfer Pic option lets you load and use any standard or double-hi-res picture for your background or character.

After lots of experimenting, we left the graphics tablet plugged into slot 7 and then used the GS control panel to turn the slot off (defaulting it to the AppleTalk setting). The Paintworks program seemed happier then, and it loaded and worked.

Another problem we've encountered may be be memory related. With the tablet installed, every time we do a lot of cut-and-paste moves with the Lasso option, the program crashes. A friend of ours reported similar crashes. The moral: Save your work often.

Here is, at long last, an animation program that operates in double high resolution.

We've been in touch with the publishers of Paintworks Plus, who weren't aware of either of these problems. They've assured us they'll be checking it out, so when we review the program next month, we hope to have a few answers for you.

And Now for Animate

For all of you who've lamented the lack of double-hi-res software, here is, at long last, a new animation program that operates in that mode—Animate. It's a perfect companion to Dazzle Draw.

Animate uses the same interface as Dazzle Draw does: pull-down menus, windows, icons, and lots of drawing and editing tools. The pro-

FIGURE 2 ILLUSTRATION © 1985 BY ROBERTA SCHWARTZ

gram actually consists of two subprograms, the Graphics Designer and the Scene Designer. With the Graphics Designer, you create and develop your characters and backgrounds, and then you go to the Scene Designer to put these characters and backgrounds into animated scenes.

The Same, but Different

If you've worked with other animation software, such as Take 1 or The Graphics Magician, you'll find that although each program uses different terminology (*actor, character, action*, and so on), the basic concepts

Animate gives you a complete set of tools for creating simple or complex animations.

are the same. You start by drawing one object (e.g., a letter, shape, or animal), and then you draw a series of variations of the same object in different positions (arms up, arms out, arms down). The program then records the separate stills, or frames, that make up the action as an actor or character (see figure 1). Next, you design a path for this character to move along, and the character, moving along this path, is saved as a scene. What sets Animate apart is that it lets you do all this in double hi-res!

Although Animate, like Dazzle Draw, is distinguished by its ease of use, we must reiterate what we've said so many times before. Creating animations is not easy. If all you want to do is make a ball bounce across the screen, you'll find you can do it with minimal effort, but if you have visions of creating a gaggle of honking geese strutting through a barnyard, be prepared to work at it.

Did we say honking geese? Yes. One of Animate's many features is a sound editor. The program presents you with a piano keyboard, a musical staff, and a series of notes and rests. Click on the piano keys, and the notes move onto the staff. Listen to your composition and, if you like it, select Done. Presto—sound in your scene! Of course, animation stops while the computer plays the musical notes (remember, Apple II-series computers can do only one thing at a time), so you'll want to choose and synchronize your sound carefully.

Animate has many features. Its File options include Load; Save; Delete; and, best of all, Transfer Pic. The latter option allows you to load and use any standard or double-hires picture for your background or character (see figure 2). Standard hires pictures are automatically converted to double hi-res. You can also save the converted picture to disk and use a double-hi-res paint program to enhance it. (Animation aside for a moment, we're delighted to have an easy way to convert hi-res pictures to the Dazzle Draw format. We hope Brøderbund will incorporate this utility into an upgrade of Dazzle Draw.)

Graphic Designer options include Zoom Edit, Copy, Paste, Flip, Invert, Text, Preview Animation, Mask (which allows the characters to pass over colored backgrounds without encountering color problems), standard and customized frames, and color printouts.

The Scene Designer gives you three different ways to set a character's path. In addition, it includes options for inserting and deleting moves, adding and removing text, adding sound, and printing.

All in all, Animate gives you a complete set of tools for creating simple or complex animations.

Programmers' Utilities

Once you've created some animations, you'll probably want to show them off. The simplest way to do so is to use the Make Show Disk function from the File menu. Similar to the Slide Show Disk option in Dazzle Draw, this function lets you make a self-booting Show Disk of your scenes.

For more ambitious projects, one of the Animate disks contains double-hi-res animation utilities that you can incorporate into your own BASIC or assembly-language programs.

A Complete Package

Animate comes on three double-sided disks. The software is disk-intensive—i.e., the computer accesses the disk drives constantly as you go from option to option. Although the program requires only one disk drive, we think that two is a must.

We found the Animate manual thorough in some areas but weak in others. If you want to do complicated animation (remember our gaggle of geese?), it doesn't have enough information about working with multiple characters in the scene editor. You'll have to do a lot of experimenting.

Before you attempt any animations, we recommend you brush up on some basics. Thoughtfully included in the Animate package is an excellent booklet called *The Art of Animation*. Do read it.

Animators' Aids

Speaking of reading, there are a few other books on animation we know you'll find helpful. Two inex-

We want the world to know what artists can do with an Apple computer.

pensive publications containing page after page of full-color examples of how to animate people and animals are *Animation* and *How to Animate Film Cartoons*. Our cavorting dog came from one of these books. Another book we highly recommend is *The Animation Book*.

We've started to receive submissions for The Graphics Gallery (the next installment of which will appear in May's *A+*). Do keep sending in your artwork. We want the world to know what artists can do with an Apple computer. See you next month. +

PRODUCT INFORMATION

Animate
Brøderbund Software, Inc.
17 Paul Drive
San Rafael, CA 94903
(415) 457-1170
List Price: $69.95
Requires: Apple IIe, IIc, or IIGS; 128K RAM; mouse, Apple graphics tablet, KoalaPad, or Joystick

Animation and *How to Animate Film Cartoons*
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The Animation Book
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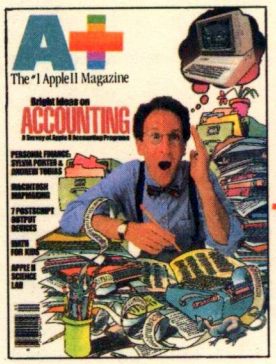

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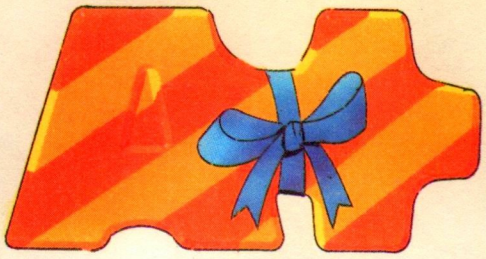

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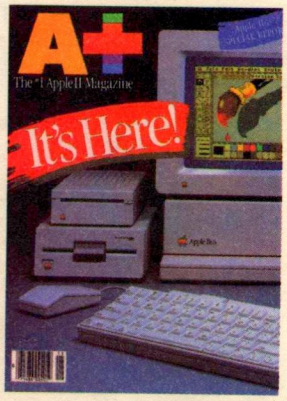

BY DAVID D. THORNBURG

AN APPLE FOR THE STUDENT

Toward a truly personal educational computer

Imagine the impact the pencil would have on education if children could use one for only 20 minutes a week and this use were restricted to the "pencil lab."

For all the excitement surrounding the use of computers in education, we can't begin to understand the true potential impact of this tool until all children have access to their own computer for use whenever, wherever, and however they wish.

In many ways it is a shame that we have applied the term "personal computer" to these massive boxes that occupy a fixed location on our desk. Computers' users must plan to be where the computers are when they are ready to use them. To my way of thinking, a personal computer ought to be flexible enough to be ready for use wherever we are.

Several years ago, I purchased a Radio Shack Model 100, a truly personal computer that accompanied me wherever I went. Even though I use it only for capturing text that I later port to my Apple computers, my Radio Shack Model 100 still tags along with me today.

No, this computer doesn't do all the things I want, nor does it have access to the software library of Apple IIe computers in today's classrooms, but it does meet my definition of a personal computer.

Apple in Education

Apple has done a wonderful job promoting the development of educational computing. It has special pricing policies and a level of corporate support that is helping bring the utility of computers to classrooms throughout the world.

This support is not enough, though. By viewing the computer through the eyes of teachers and parents, Apple misses the most important perspective of all, the view through students' eyes. Children are highly mobile creatures; their work and play are intertwined. The family-room corner, kitchen table, and front lawn are equally valid places to work, play, and study. A computer of utility to a student should be versatile enough to accommodate ready use in any location.

If Apple really wants to have an impact on the use of computers in education, it should create a IIe-compatible that is truly portable—a genuinely personal computer.

Can It Be Done?

The first time I lifted the lid of an Apple IIGS, I realized that my dream for a laptop portable Apple II was close to becoming reality. The Apple IIGS contains a special chip called the Mega II that contains the essential circuits of an Apple IIe, except for the RAM and microprocessor. It contains the ports and everything else that makes the Apple II tick.

As soon as I saw this chip, I decided to "design" the "Apple IIp" (code-named the Pippin). Of course, since I am not an Apple Computer employee, this design is only in my mind (and now in this article.) The computer I am about to describe does not yet exist, although it could if Apple wanted it to.

The Pippin tips the scales at just less than two pounds (including batteries). It has a built-in liquid-crystal display that displays hi-res graphics at the proper aspect ratio (unlike the squished liquid-crystal display that used to be sold for the quasi-portable Apple IIc). An external monitor jack lets you connect the Pippin to a standard color monitor if you want.

ILLUSTRATION BY ANDREA EBERBACH

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This computer has a IIc keyboard, one serial port, one external disk-drive port, and the standard IIc game port for touch tablets and the like.

Lifting the Hood

This computer also has the Mega II chip as its core, and it uses the 65C02 processor. The internal RAM is 128K (nonexpandable). The strangest aspect of this computer is its "internal disk." Rather than holding extra weight, consuming precious power, and being susceptible to mechanical breakdown, the Pippin uses a built-in 128K RAMdisk with additional memory to hold ProDOS 8 in ROM. This RAMdisk has its own battery-backup power supply, so information always remains in storage.

Unlike raw ProDOS, the ProDOS ROM contains utilities for copying volumes, so you can upload and download programs and data from a standard disk drive whenever you need to. Thus, you can have easy access to the vast library of Apple II software. As far as a user is concerned, the only difference between the RAMdisk and a traditional drive is that the RAMdisk works at blinding speed.

Any attempt to complicate the design of this computer by making it expandable misses the point of the machine and should be avoided. By providing one serial port and one disk port, the computer lets you use printers and transfer files to traditional disks whenever you have to. Applications requiring more RAM are not likely to be important for the upper-elementary and high-school market, so adding this expense to the computer is unnecessary.

The Pippin should retail for $499, although anything lower would be heartening.

Whenever a new laptop computer becomes available, the better-read pundits ask how this computer relates to Alan Kay's original idea for a super-smart portable computer called the Dynabook, a visionary machine of which the present Macintosh is only a stone-age relative.

The Pippin is not a Dynabook—it does not have any capabilities beyond those already familiar to all Apple IIe users—which is its greatest strength. With a computer with the ability to run the Apple IIe educational software within the reach of every student, computers in education can start to make a real impact.

Two major stumbling blocks are in the way of the realization of this vision. First, Apple needs to design the computer. The technologies necessary for the display and battery-backup RAMdisk are well known by now, so they shouldn't present any problems. The real challenge for Apple is to decide if the market is big enough to warrant the introduction of the IIp. Apple's market-research department should be careful not to base its sales projections on the presently disappointing sales of other portable computers. The computers in the price class of the Pippin have no software base to speak of, which has kept many from buying these otherwise fine computers.

The second problem is one that faces the rest of us. The prospect of shelling out $500 (or even $100) for educational tools is sobering to many parents, especially for families like Tommy's.

Tommy was a child in my wife's classroom a few years ago. At times, Tommy and his mother slept in the streets. During the rainy season, we took Tommy into our home for a few days just to be sure he had a warm place to sleep.

Who buys a computer for the Tommys of the world?

Here is where the great plans and visions of computer companies fall flat. Tommy and his friends are the ones for whom access to computers is the most important. The more I think about it the more I believe that the taxpaying public should be purchasing these computers for all children, just as our founding fathers saw fit to ensure equal access to education.

Even notoriously tightfisted states (such as California) spend more than $2000 per year on the public education of each student, however. A jump of a few hundred dollars to provide a computer for each child entering third grade seems like a small price to pay.

If Apple provides the technology, will the rest of us take the next step to make this technology available to all children? ✚

Dr. David Thornburg captured the notes for most of this article on his Radio Shack Model 100. He wishes he had access to an Apple IIp so he wouldn't have had to transfer his notes into another computer to finish the article.

A+ TEACHERS' TOOLBOX

Wondering which of the thousands of educational programs are worth your money and attention? We've created *A +* Teachers' Toolbox to help educators, parents, and students sort through the vast array of educational software for the Apple II Plus, IIe, IIc, and/or IIGS. Each month *A +* will have a group of nationally recognized education experts select some of the best programs in different educational categories. This month, our recommendations are adapted from the 1986 edition of *Only the Best*, an annual directory from Education News Service in Carmichael, California. *Only the Best* draws its listings from reviews by 22 educational organizations across the country. Only the products that receive consistently superior ratings appear in this publication. This month, we feature math programs for preschool through first grade. Note that many programs are also appropriate for higher grade levels.

ADDITION 0-5, ADDITION 0-6, ADDITION AND SUBTRACTION 0-5, and ADDITION AND SUBTRACTION 0-6

Drill-and-practice programs to help students count objects and learn math equations. Computer supplies answer after two incorrect responses and allows teacher to change lesson speed, view and erase student scores, and turn off sound. Includes lessons for older children; recommended for special education as well.

List Price: $29.95. CompEd, P.O. Box 35461, Phoenix, AZ 85069; (602) 931-7233

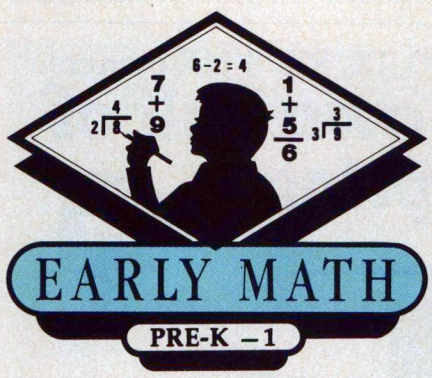
Requires: Apple II Plus, IIe, IIc, or IIGS; 48K RAM

COUNTERS: AN ACTION APPROACH TO COUNTING AND ARITHMETIC

Provides drill and practice in counting and in simple addition and subtraction through the use of animation, color, and sound. Gives immediate feedback for correct and incorrect answers. Program uses extra-large numerals.

List Price: $59 for schools; $44.95 retail (excludes teachers' guides). Sunburst Communications, Room D 7575, 39 Washington Avenue, Pleasantville, NY 10570-9971; (800) 431-1934; in NY, AK, CT (914) 769-5030

Requires: Apple II Plus, IIe, or IIc; 48K RAM; color monitor recommended



BASIC MATH FACTS AND GAMES

Four games providing practice in addition, subtraction, multiplication, and division at four levels of difficulty, starting at grade 1. Includes teachers' manual and record-keeping forms and requires only minimum supervision.

List Price: $49.95. Random House School Division, 400 Hahn Road, Westminster, MD 21157; (800) 638-6460; in MD (800) 492-0782; in AK and HI (301) 848-1900

Requires: Apple II Plus, IIe, or IIc; 48K RAM

COMPUTER MATH GAMES, VOLUMES 1, 3

A series of games for one to four students providing practice in basic math skills. Level of difficulty of each game can be controlled. Volume 1: Whole-number, decimal, fraction, or integer practice; plotting ordered pairs; place-value practice; problem solving. Volume 3: Counting and comparing whole numbers; timed practice with whole-number facts; timed practice squaring numbers; timed practice with reducing fractions; practice adding integers. Starts at grade 1 and includes lessons for older children as well.

List Price: $52.50 for schools; $60.38 retail. Addison-Wesley Publishing Company, Jacob Way, Reading, MA 01867; (617) 944-3700

Requires: Apple II Plus, IIe, IIc, or IIGS; 48K RAM

LEARNING ABOUT NUMBERS

Three separate programs providing practice in counting and telling time and drill of addition, subtraction, multiplication, and division facts. Immediate feedback is provided for both correct and incorrect answers. Program offers demonstration after two unsuccessful tries. Management system allows teacher to adjust difficulty level, to customize games, and to keep records for up to 50 students. Optional audio feedback. Includes lessons for older children.

List Price: $50 for schools; $40 retail. C&C Software, 5713 Kentford Circle, Wichita, KS 67220; (316) 683-6056

Requires: Apple II Plus, IIe, IIc, or IIGS; 48K RAM

CLOCK

Three lessons, starting at grade 1, providing practice in telling time: converting from digital time to clock time; setting clock hands when time is given in words; and typing digital time from clock time. Animated clock face provides feedback. Program can keep records for 40 students and is appropriate for older children as well.

List Price: $39.95. Hartley Courseware, Inc., 133 Bridge, Dimondale, MI 48821; (800) 247-1380; in MI (517) 646-6458

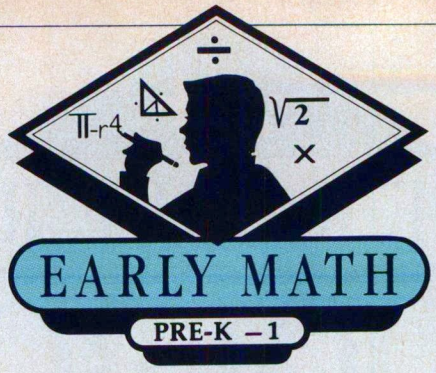
Requires: Apple II Plus, IIe, or IIc; 48K RAM

COMPUTER MATH ACTIVITIES, VOLUME 3

Gamelike program for practice in recognition of number patterns. Also provides practice with whole-number, decimal, and integer operations as well as problem solving. You can control the level of difficulty of each activity. This program is designed for use by individual students or small groups, starting with grade 1.

List Price: $52.50 for schools, $60.38 retail. Addison-Wesley Publishing Company, Jacob Way, Reading, MA 01867; (617) 944-3700

Requires: Apple II Plus, IIe, IIc, or IIGS; 48K RAM



COUNT AND ADD

Four programs providing practice in counting numbers up to 56 and adding two groups of up to 16 objects each. Programs allow teacher to adjust number of objects to be counted or added and number of items in a lesson. Optional audio feedback.

List Price: $34.95. EduSOFT, P.O. Box 2560, Berkeley, CA 94702; (800) EDUSOFT; in CA, AK, HI (415) 548-2304

Requires: Apple II Plus, IIe, IIc, or IIGS; 48K RAM

COUNT 'EM

Introduces children to counting and basic addition and subtraction through the use of color, sound, graphics, and animation. Program provides student summary information at end of each set of ten. Optional audio feedback. For use by individual students or small groups.

List Price: $10.95. Micro Ed, Inc., P.O. Box 444005, Eden Prairie, MN 55344; (612) 944-8750

Requires: Apple II Plus, IIe, or IIc; 48K RAM

EARLY ADDITION

Drill-and-practice program that uses graphics to challenge students in whole-number addition with sums of 10 or less. Uses both vertical and horizontal formats and increases in difficulty levels. Pictorial menus allow students to use program with little assistance. School version includes teachers' guide. For grades 1 and 2.

List Price: $49 for schools; $29 retail. MECC (Minnesota Educational Computing Corporation), 3490 Lexington Avenue North, St. Paul, MN 55126; (612) 481-3500

Requires: Apple II Plus, IIe, or IIc; 48K RAM

FAY: THAT MATH WOMAN

Provides drill and practice in the addition, subtraction, multiplication, and division of whole numbers 0–18. "Fay" presents a graphic illustration of how arithmetic equations work by walking (in addition and subtraction), pausing, or leaping (in multiplication and division) along number lines. Program includes four tutorial levels of 15 number lines each and 2 game levels with a time factor. Students can compete for improved scores. The program has optional audio feedback. Includes lessons for older children.

List Price: $39.95 for schools; $29.95 retail. Didatech, 3812 William Street, Burnaby, British Columbia, Canada, V5C 3H9; (604) 299-4435

Requires: Apple II Plus, IIe, IIc, or IIGS; 48K RAM

MATH MAZE

Drill-and-practice program in arcade video-game format that provides practice in addition, subtraction, multiplication, and division. Students can select difficulty level of the math problems and skill level of the game. Includes 40 mazes. Also allows students to create their own mazes. Optional audio feedback. Appropriate for older children as well.

List Price: $39.95. DesignWare, Inc., 185 Berry Street, San Francisco, CA 94107; (800) 572-2272; in CA (415) 546-1866

Requires: Apple II Plus, IIe, IIc, or IIGS; 48K RAM

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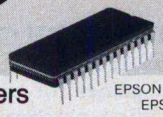

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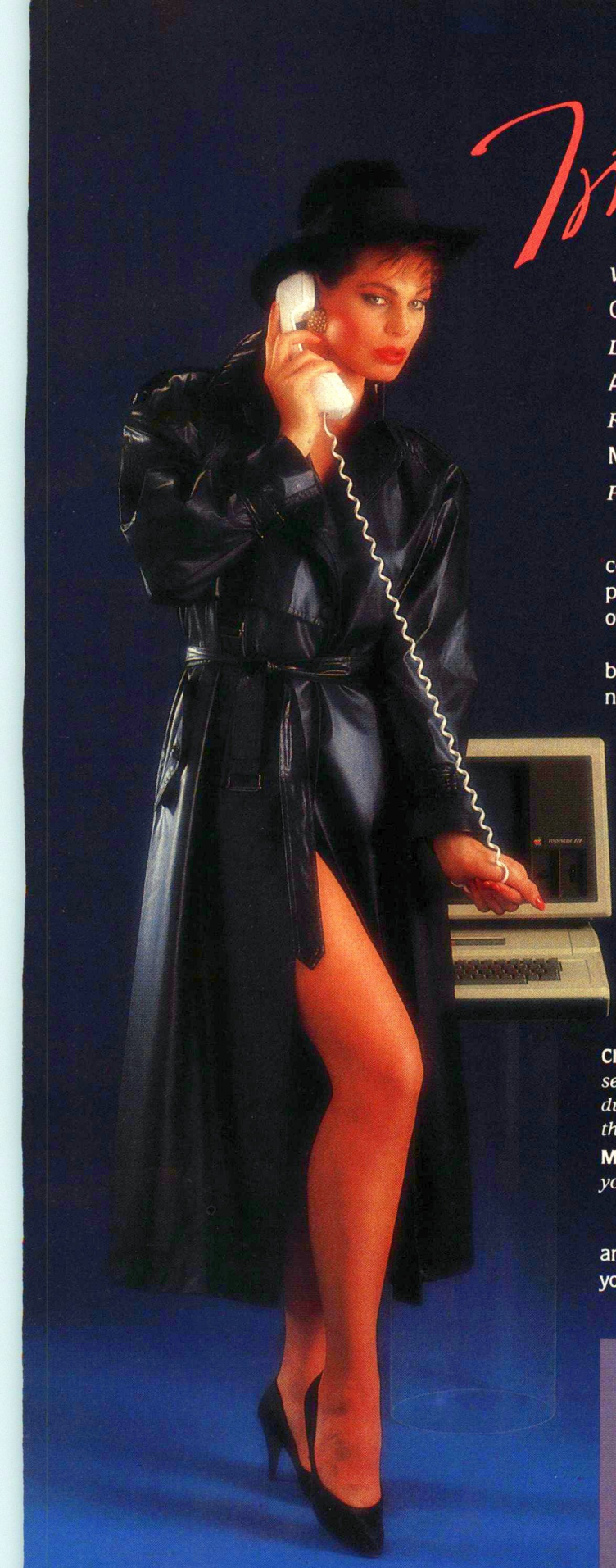

Interlude II

MATA HARI—Interlude #156

What time does your flight arrive?

Oh, are you picking me up?

Look for a tall brunette in a trenchcoat... and nothing else.

Ah, you've been playing Interlude again!

Right.

Maybe I can catch an earlier flight.

Please do.

Interlude II. The long-awaited sequel to the first adult computer game in history is finally here. It's provocative and playful! Outrageous and romantic! It has all the excitement of the original Interlude, plus significant new features.

The computerized interview, which is taken by one or both players, has been greatly expanded. It probes your innermost desires to discern your mood of the moment, your secret longings, your special fantasies, and then suggests for your pleasure one of its more than 160 Interludes. You can ask the computer for an Interlude for now, or one for later. Special options give each player added control over surprises and special erotica hidden in the Interludes.

The original Interlude took the computer world by storm six years ago, creating a media sensation:

FORUM Magazine: *"The Interludes are imaginatively and sensitively written... the computer's recommendations are uncannily appropriate."*

US Magazine: *"The most edifying third party to join couples between the sheets since* The Joy of Sex."

Chicago Tribune: *"This marriage of computer technology and sex is natural... erases forever the image of computer-users as dull guys with slide rules in their pockets and square roots on their minds."*

Money Magazine: *"Sometimes it's easier to tell a computer what you want than it is to tell your partner."*

Interlude II will take you to the outer limits of fantasy and romance. And, if the computer selects Interlude #99 your love life may never again be the same.

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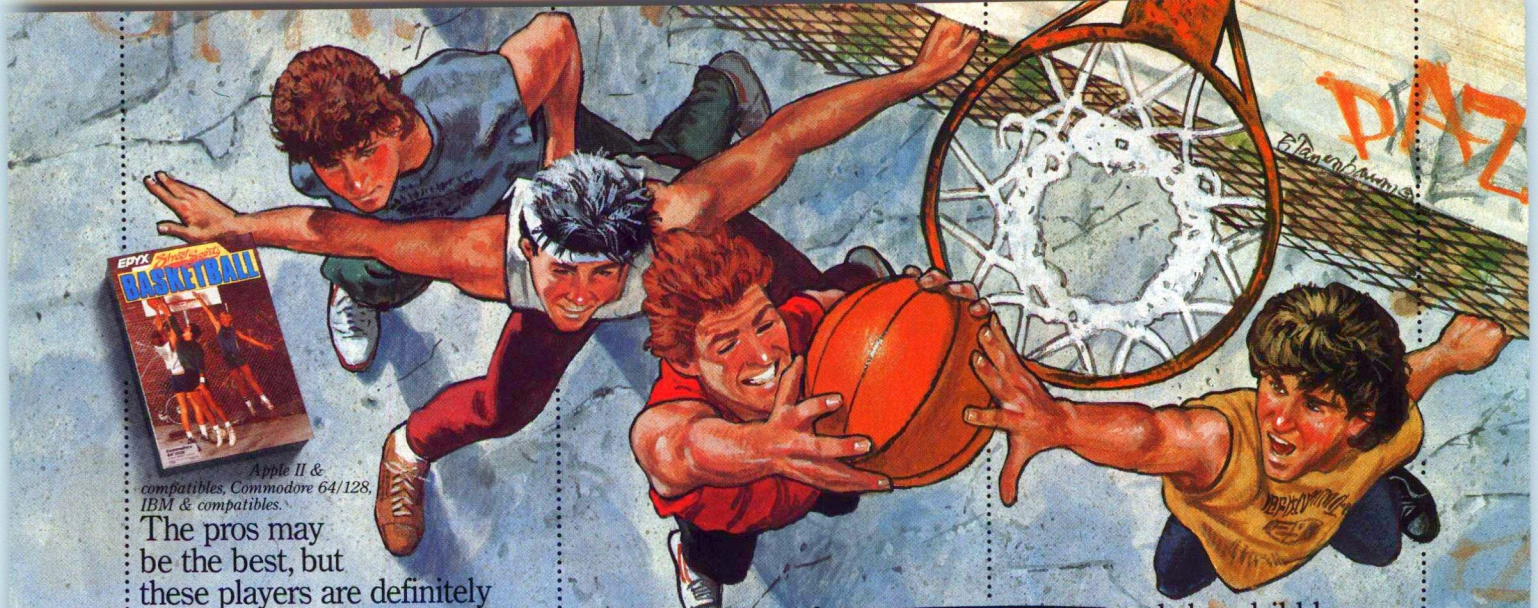

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Sometimes it's best to take a pass.

TASTE THE THRILL OF VICTORY AND THE AGONY OF THE STREET.

Let Joey pop 'em from the corners. This is real street strategy. Take a hook shot. A tip-in. Bounce the ball off the chain-link fence, then go for the basket. Or power through for a slam dunk.

But don't dribble in the oil slick. And for heavens sake, watch out for windows.

It's not like any basketball game you've ever played on a computer. But just like every basketball game you've ever played for real.

ANOTHER HIT.

It's bottom of the ninth. Batter's 0 and 2. The score—well, maybe it's time to take up bridge.

Introducing *Street Sports Baseball.*

Okay. The pitcher winds, throws, and, crack! It's a long fly ball to, to, yes, it's going—bang. Right in his glove.

Notice that somebody just stole second base. Funny, it was here a minute ago.

It's not going to be as simple as you thought to be the first on your block.

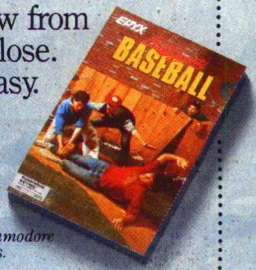
After all, you'll have to cope with makeshift diamonds, bases made from spare tires and trashcans, bushes, rocks, even squealing cars.

Not to mention 16 neighborhood players. Each with their own personalities and skills in pitching, hitting and fielding. With the right combination, you could be the champs. With the wrong combination, the chumps.

You'll pick the place. The team. The positions. The strategy. And then, you'll be right in the middle of it all. With a split-screen view from above and up close.

It won't be easy.

But it's right up your alley.



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GamePort

GamePort takes a behind-the-scenes look at Lucasfilm Games and previews some of the first entertainment offerings for the IIGS.

FIELD TRIP TO LUCASFILM

You are in your car. Up ahead, a two-lane blacktop winds off into the hills of Marin County, California. What now? FIND THE GATE AND DRIVE THROUGH IT.

Just off the road, you see an unassuming gate blocking a driveway. As you pull up, it opens automatically and you drive through to the guard. SHOW YOUR CREDENTIALS AND DRIVE ON.

The guard motions you on, and suddenly the wide-open landscape is dotted with fantasy buildings that look like they've been airlifted from Disneyland. An old farmhouse rises on the left. In the distance, an imposing brick edifice overlooks a small lake. Further on, a Victorian mansion conveys a stately presence, its white grandeur made elegant by a crystal-domed greenhouse. As you pass a firehouse, the logo on the side of the fire truck tells the story: Skywalker Ranch. You're in Lucasfilm Country.

Visiting the headquarters of filmmaker George Lucas' Lucasfilm production company is something of an adventure game in itself. Employees precisely tell visitors how to reach the site in tenths of miles, so concealed is the spot. The Skywalker Ranch is hidden carefully from the tramping Nikes of curious film fans.

So what was a humble computer-games columnist doing in this paradise of multimillion-dollar imagination? Plotting how he would brag to the folks back home, for one thing. But the real reason was to visit Lucasfilm Games, the computer-entertainment division of the Star Wars empire.

Behind the Victorian mansion is the Stable House, a set designer's concept of English country charm with its stone-arched courtyard and wood-beamed ceilings. From out of that stable have galloped pace-setting Lucasfilm Games creations such as Epyx's Rescue from Fractalus and Ballblazer as well as, recently, Activision's Labyrinth. The company's latest breakthrough is P.H.M. Pegasus, a detailed simulation of a military Patrol Hydrofoil Missilecraft.

Entering the office of designer/programmer Noah Falstein gets things a bit closer to reality. Games and papers and floppy disks are scattered next to a mainframe-computer workstation and an attached microcomputer. Falstein types a few com-

The P.H.M. Pegasus design team (left to right): Chris Grigg, Lawrence Holland, Ken Macklin, Noah Falstein.

mands on his mainframe terminal, and the micro screen fills with a display of a hydrofoil control panel overlooking a blue ocean.

Suddenly, the microcomputer screen comes to life, and Falstein is looking out the window of the bridge, racing a hydrofoil across the waves. He fires chaff to mislead radio-controlled missiles and sinks enemy vessels with carefully aimed rockets. "The hydrofoil has a high-tech, exciting feel to it," Falstein understates.

When he was looking for something "fast-moving and exciting" for a new Lucasfilm game, Falstein avoided the obvious. "The super helicopter or spaceship simulators are becoming passé." Besides, it's difficult to graphically realize contoured, point-of-view landscapes in an Apple II. Most attempts fail miserably. After toying with a hovercraft game, Falstein opted for a hydrofoil when he discovered that the vessels were actually in use in the military.

There was one additional advantage for a programmer. "The water is nice and flat." Even so, the graphics of P.H.M. Pegasus are hardly austere. Using a special graphics system developed by Lucasfilm Games, Pegasus can zoom in on enemy craft in simulated three-dimensional perspective with the aid of a realistic on-screen dash panel with working gauges.

In eight strategic scenarios, P.H.M. Pegasus imitates the weaponry and navigational characteristics of three military hydrofoils in use by the navies of the United States, Israel, and Italy. Falstein and colleagues consulted a hydrofoil test pilot at Boeing to ensure the authenticity of Pegasus' maneuvering.

That authenticity surfaces in occasionally unusual ways. For instance, even if the hull is damaged, a hydrofoil will not sink until it slows down because once it is up to speed, the ship sails above the water's surface. "So, if you're hit, you just have to keep moving so you don't sink into the water. Of course, you can always run out of gas." Falstein smiles slyly.

P.H.M. Pegasus is published by Electronic Arts.

GS LOVES GAMES

The romance begins. GS stands for Game Software as publishers begin flirting with the glamour machine of the Apple II line, and no one is overlooking the alluring possibilities of those attractive graphics and provocative sounds.

Activision, one of the early supporters of the GS, has stepped out with Tass Times in Tonetown, a graphics adventure in which computer punks meet rock punks. Ankle hooplets and Day-Glo hair are optional.

Leave those rad follicles at home and get inconspicuous when invading the security system of Activision's

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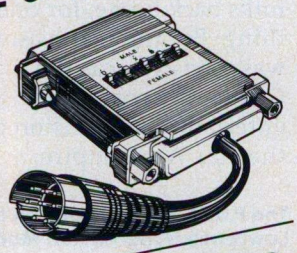

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CIRCLE 207 ON READER SERVICE CARD

Hacker II. Designer/programmer Steve Cartwright has put four simulated video screens on your single GS screen, all the better to steal secret documents from a Siberian military installation. The GS version adds graphic detail and rib-shaking sound to a game that's already wowing them on the Apple IIe and IIc.

For something a little less intense, relax in the pleasures of Shanghai. Designer Brodie Lockard has combined the visual beauty of Mah-Jongg tiles (stunning on the GS) with

the elegant play value of solitaire, in a modern classic. For a bit more stimulation, play against a friend in the timed Challenge mode.

The crowd's consoling "AAaaaaahhhh" makes a blundered putt just a little easier to take in Mean 18, the hit golf simulation from Accolade. The GS digitizes the coos of onlookers and recreates lush fairways. When you've played through four international courses, design your own with the Course Architect option.

Epyx takes the GS on an international quest for bizarre sports in World Games. Cliff diving, barrel jumping, log rolling, and the ever-popular (at least among kilt wearers) caber tossing provide novel challenges for Apple-bound athletes.

The GS fights the war in the Pacific in Epyx's Destroyer, an arcade/strategy simulation of a World War II Fletcher Class United States Naval Destroyer.

Detonate star-wars missiles for peace or joust for the glory of old England in Mindscape's SDI and Defender of the Crown. These Cinemaware movies on a disk for the GS are unashamedly aimed at the masculine sex and cast the player as leading man in a choice of heroic roles. In SDI, our hero orbits the Earth romancing a Russian beauty and protecting the planet from all-out war. In Defender of the Crown, players conquer castles and rub chain-mail shoulders with Robin Hood. The eye-popping Commodore Amiga version of Defender was a Christmas best-seller. The GS conversion is scheduled to be bigger and feature more options.

Finally, Apple IIe/c gamers probably thought they had seen it all in the role-playing action of Electronic Arts' The Bard's Tale. Wrong, orc breath. It's a brave new world of eye- and ear-searing action when The Bard's Tale debuts on the GS. From the dripping gore of a zombie's nasty midnight snack to monks murmuring a healing Gregorian chant, the GS works audiovisual urban renewal in the monster-infested streets of Skara Brae. +

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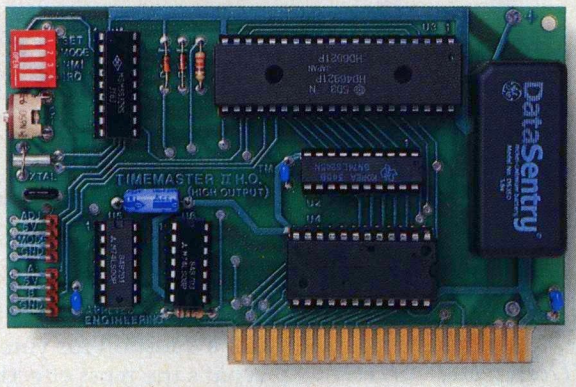

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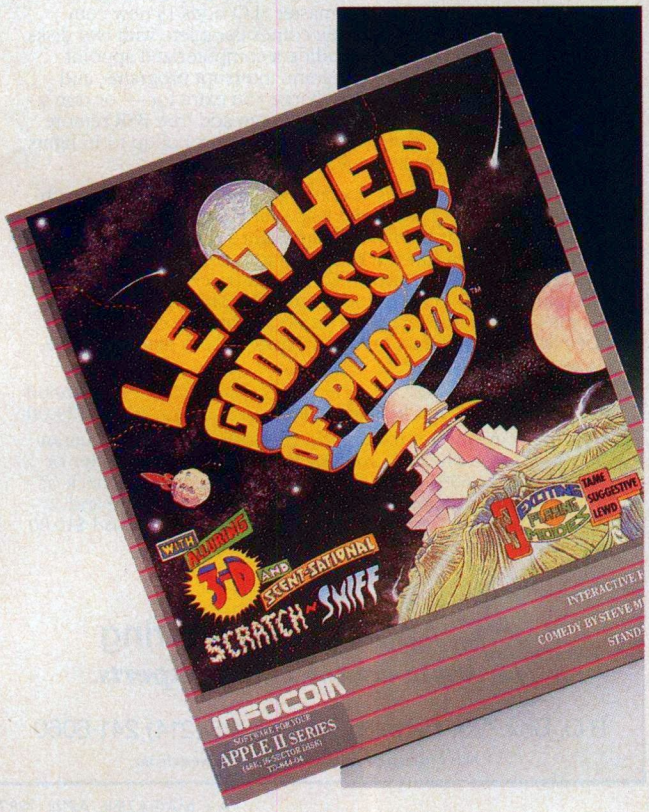
Reviews

This month's games bring you ribald adventure, some challenging boxing matches, and a gumshoe detective caper.

YOU GOTTA HAVE A GIMMICK

Got a question for you: What's the most effective marketing gimmick known to mankind? I'll give you a hint. It sells everything from automobiles to toothpaste. Give up? The answer is sex.

So it's no surprise that sex has once again found its way to text-adventure games. Infocom's Leather Goddesses of Phobos is actually the second major text adventure with a baldly ribald plot. (Do you remember the first? The answer is at the end of this review.) What's important here is that the erotic theme made Leather Goddesses of Phobos (LGoP) one of the most eagerly awaited games in recent memory.



Steve Meretzky, author of LGoP, has many fans in the interactive-fiction world, having previously contributed Planetfall, Suspended, and A Mind Forever Voyaging to the genre, as well as coauthoring The Hitchhiker's Guide to the Galaxy. With his latest work, Meretzky has fashioned a spoof of 1930s pulp science fiction. No matter what you might infer from the racy sado-masochistic images "Leather Goddesses" conjures up, the game is nothing more than a Zorkian treasure hunt. This time you start in Upper Sandusky, Ohio, and wind up on a wacky journey through time and space, traveling through the solar system in search of the eight bizarre items you need to make an "anti-leather goddesses machine."

You see, from their base on the Grand Canal on the planet Mars, those nasty Leather Goddesses are preparing to enslave every man and woman on Earth—presumably to do unspeakable things to earthlings once we are their "private toys." (Preferring to have matters spelled out for me, I wanted to know exactly what those unspeakable things were, but I never did find out. Sigh.) So it is up to you to collect the machine parts that will ultimately vanquish the Leather Goddesses. I must admit that I was a bit disappointed at the ending—the "losing" outcome seemed as if it would be much more fun than the "winning" one.

As if the sexual theme weren't enough of a gimmick, LGoP offers four other clever devices. First, you may play the game as either a man or a woman, and the text describing your adventures throughout the game (both sexual and otherwise) conform to the choice. Second, you can pick from three different "naughtiness levels" that affect the tone of the text: Suggestive (the default mode), Tame (yawn!), and Lewd (the preferred level of 999 out of 1000 gamers, as I found from my own unauthorized and undocumented study). Before you may enter the Lewd mode, however, you must state your age (no one under 18 allowed!). In a burst of uncharacteristic dishonesty I refused to tell the game my right age. I typed 18, the game believed me, and I was then able to lap up every last lascivious detail. The

third and fourth gimmicks are part of the packaging: a scratch 'n' sniff card and a 3-D comic book that you must read (using the provided 3-D decoder glasses) because it contains clues to help you solve the game.

Infocom bills LGoP as a Standard Level game, meaning it is suitable for both first-time and experienced players. The puzzles range from the deceptively simple (the vizicomm booth) to the sublimely ridiculous (trying to kiss the frog) to the challenging (hint: look at the barge from the dock) to the difficult (the catacombs maze).

Even at its lewdest, LGoP is not pornographic. The sexual content is no higher than what you can see every week on "Dynasty." LGoP is humorous and fast-moving, and even when the writing is ribald, it is never cheap—it is amusing and clever. But to my taste, Meretzky's cleverest idea by far is the title. "Leather Goddesses of Phobos" is what is called a "money title." It teases. It titillates. It promises. It makes you want to buy the game.

The first sex-oriented text adventure was called Softporn Adventure and was released years ago by a company still in existence that now prefers that people forget its early effort. If I remember correctly, it was a pretty successful game, and I predict that LGoP will enrich Infocom as well. Let's face it, sex sells!

Donald Oliver

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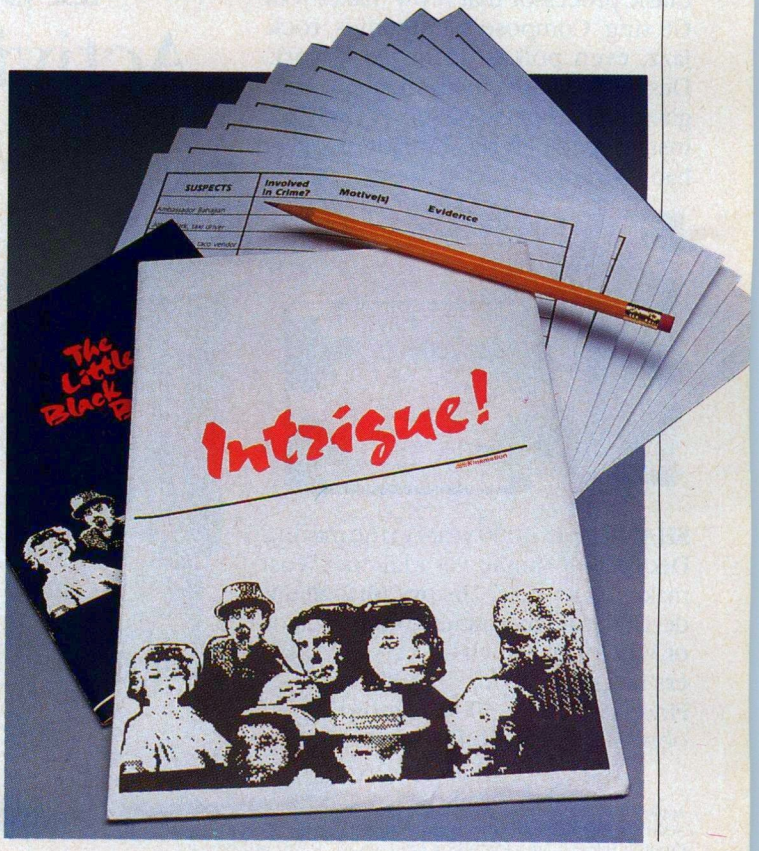
A REAL KNOCKOUT

Fight Night from Accolade is really a collection of boxing routines for one or two players. The Main Event is a series of matches between your fighter and some increasingly nasty opponents. Leading up to the Main Event, you might choose to practice in some training and sparring sessions, and you might participate in a round-robin tournament reminiscent of the Olympics or the Golden Gloves.

You can begin by creating a boxer in the Boxing Construction area. Here you select among various body parts (head, torso, trunks, and legs) to build your most formidable fighter. If he is to be human-controlled, you define his relative power and resistance to blows in percentages. For instance, a fighter can have 65% of his power in the head, but he will then only have 35% power in the body. For computer-controlled boxers, you must also define the percentage of time they spend on offense and defense as well as their general intelligence (brains vs. action).

The training section of Fight Night is real—not for the created boxer, but for you, the player. You can elect to lead or to follow. In the Follow mode, the program shows the actions you must take. By quickly moving the joystick as instructed, you learn useful patterns of movement, feints, blocks, and blows. When you choose to lead, you can practice your own timing on the punching bag. Each blow comprises four pulses: selection of the move, windup, delivery, and follow-through. Part of the training is getting accustomed to this four-step process, because it



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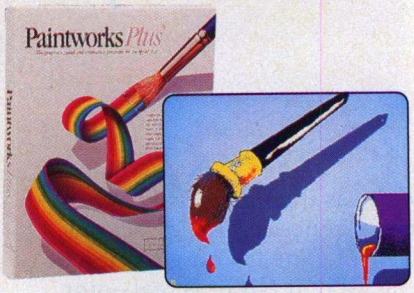

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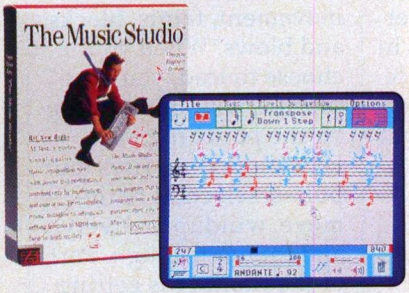

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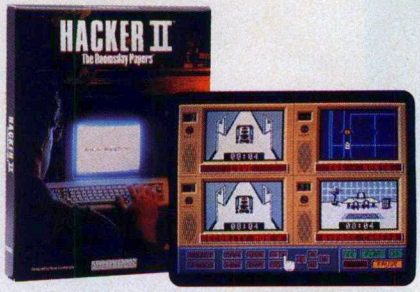

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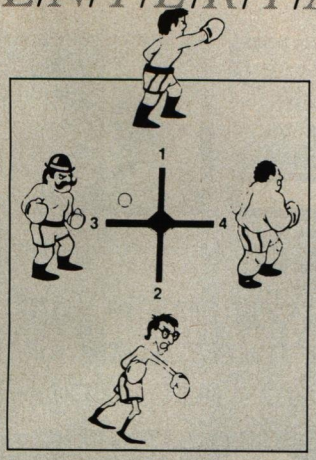

happens quickly in the ring. Each time you are hit, you can't throw a return punch for one to three pulses, depending on the force of the blow you receive.

The game has only eight moves: forward, backward, block low, block high, feint jab, feint body blow, jab, and body blow. A more complete arsenal of punches would have made the game more realistic and challenging.

After training, you can move to sparring. Here you select two boxers and practice for three rounds. You can box at slow, medium, fast, or very fast speed (these choices hold in all of the combative sections of the game). At slow speed, you should be able to see the pulses of movement and react appropriately. At very fast speed, be ready to move quickly. You won't see the windup and delivery as separate events.

To get additional experience, you might try the tournament. Here you select the boxers to fight in a single-elimination round-robin. You can select human-controlled fighters against computer-controlled fighters or fight in the two-player mode. Unfortunately, one player has to use the keyboard, but, although it takes some getting used to, the keyboard is not that much worse than the joystick. Still, the contests would be more even if the program could accommodate two joysticks.

Once you've tried everything else, the Main Event awaits you. Here you go up against some truly bizarre boxers—each with his own sucker punch. Ranked number 4, Dip Stick is a skinny, bespectacled wimp who, nonetheless, packs a sig-

In the Main Event, you go up against some truly bizarre boxers—each with his own sucker punch.

nificant wallop in a floor-to-ceiling uppercut. Then comes cigar-smoking Kid Kastro; Hu Him, an Oriental powerhouse whose specialty is the karate kick; British Bulldog, complete with derby and neck-stretching super punch; and, finally, The Champ—the Bronx Bomber. Not only does The Champ have all the boxing skills, but his sucker punch also literally squashes you, and he's not afraid to use it—and use it!

If you are determined to win the Main Event, you can select a rematch each time you lose. To beat The Champ you may need several rematches.

If you want to see how you would fare against any of the Main Event fighters sans sucker punch, you can pit your boxer against him in the round-robin. Unfortu-

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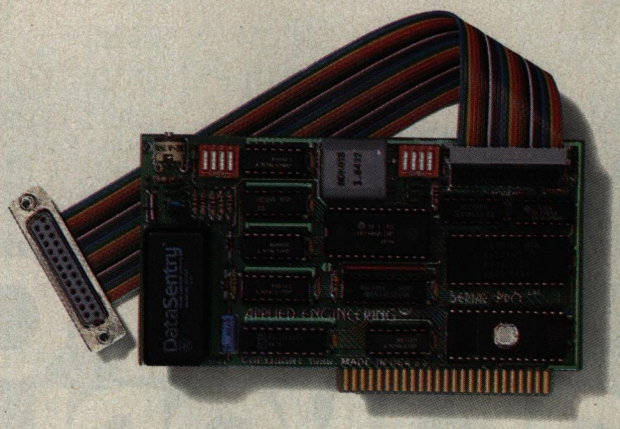

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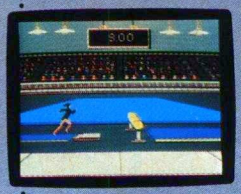

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nately, you can't take a created boxer into the Main Event. The ranked fighters are not the same without their special punches, so there's no way to test the pugilistic prowess of your creation against the full devastation of the Bronx Bomber's squasher punch (a punch that reminds me of

something Ali threw to knock out Quarry in the first round of their fight years ago).

In operation, Fight Night uses pull-down menus and selection screens similar to those of the Macintosh, which adds to the slickness of the program. The graphics are amusing and fairly smooth, disk loading is slow, the action during a fight incessant. Learning to use the various combinations of feints, movements, blocks, and blows effectively and with good timing takes a good deal of practice.

A few minor drawbacks notwithstanding, Fight Night has enough variety and challenge among its various parts to keep you occupied for a while. Just remember to keep your guard up and don't telegraph your punches.

Rusel DeMaria

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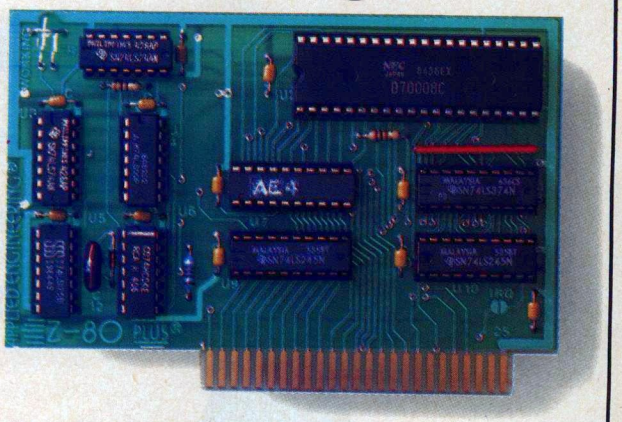

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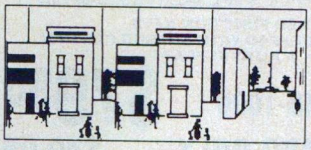
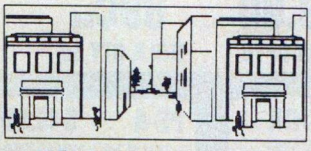
suspects), and telephone numbers to enable communication with the office and with persons and services necessary to solve the mystery. In addition, the game includes suspect sheets to help you keep track of the various clues. You also get a hint sheet, which you can use if utter despair sets in during your quest.

The characters you encounter retain their basic persona from game to game but alternate in their roles as friend and



foe. Among the more colorful suspects besides Cruces are *Washington Post* reporter Diane Hunter, neo-Nazi cabdriver John Clark, FBI agent Mike Kruger, and a potentially dangerous wino named Moe. As the private eye, you have the same initial goals in each game: obtain a schematic of the PF-13 cannister, get a key to the thieves' hideout, discover the hideout, and deactivate the cannister before the virus is released into the humid skies of D.C.

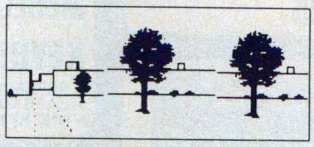


When you encounter another person, Intrigue! prompts you with four options at each new screen. A multiple-choice format prevents the deadlock that can occur in some less forgiving games, but it becomes tedious after the initially witty options become familiar.

In addition, the graphics—which seem to have

Your brother is missing, D.C. is in peril, and Intrigue! leaves it all up to you.

real potential—were not impressive on my system. Instructions indicate the game should be played in black and white, but when I shifted to that mode (using an Apple IIe with a Video 7 color card and an Amdek 500 color monitor), the text became nearly unreadable and



the graphics a blur. I preferred to play in color—the text definition was better, and the graphic images were randomly colored but discernible. Intrigue! is a one-to-four-player game, but I found it frustrating with more than one player, since turns were interrupted at inopportune intervals.

Saving your brother and defusing the PF-13 cannister do not solve the puzzle, although they do save you and D.C. from the immediate peril. Identifying the guilty parties—the game's ultimate goal—may not be as easy, and, ultimately, that goal is what gives the game its extra edge.

Dana Charles Jones

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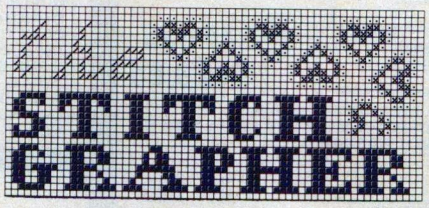

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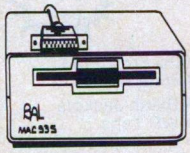

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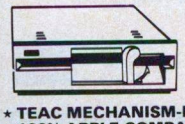

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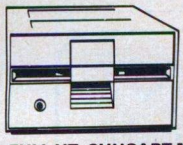

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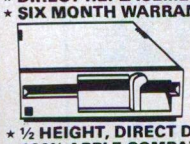

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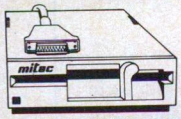

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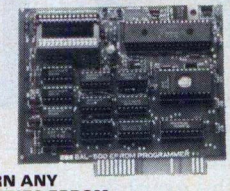

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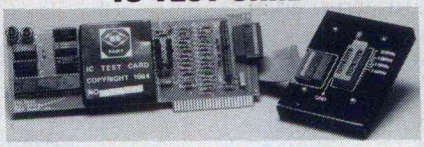

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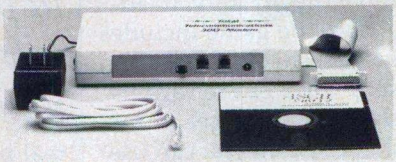

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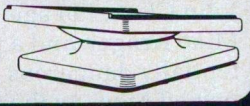

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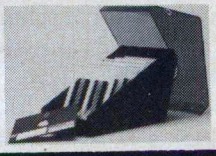

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CIRCLE 167 ON READER SERVICE CARD

BY MICHAEL WIESENBERG

THIS DIGIT IS ONE IN A MILLION

Deriving integral digital details with your Apple

You can form an infinitely large number by writing successively all the integers beginning with 1, in this form:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
and so on.

What digit occupies the one millionth position? How many digits does the integer formed in that position have, what position does the integer occupy in the total number of integers with that many digits, and what position does the digit in question occupy within that integer? Your program ought to find the answer in seconds. As an example of what I'm looking for, the 15th digit is 2, and it is the second digit in the third two-digit number; the 333333rd digit is 8, and it is the fourth digit in the 58889th five-digit number. (Trust me.)

Send a complete program that gives the answer for *any* digit. Include sample output and running time. If you send a disk, please also enclose hard copy. Your program must be short, elegant, and self-documenting. The best solution wins a one-year subscription to *A+* and a Certificate of Excellence in Programming and will be published here.

Please send all entries, which must be received by April 13, 1987, to Computer Calisthenics, Box 2329, Stanford, CA 94305. (Important note: Please send your entries via *regular* mail only. I do not receive in time any mail for which I must sign.) All entries become the property of the author. The winner will be selected by the author, whose decision will be final. The winning program will be announced in the June 1987 issue of *A+*.

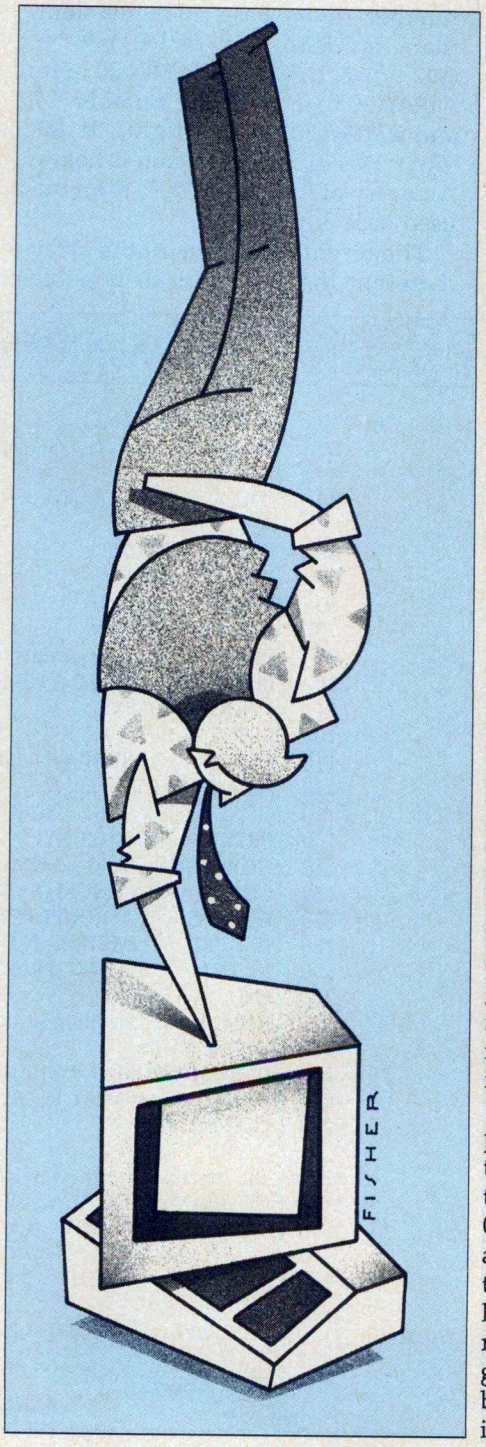

ILLUSTRATION BY MARK FISHER

Answer to January's Puzzle

January's puzzle requested a program that found the counterfeit coin among 12 coins with only a balance scale and no weights. I asked the minimum number of weighings and what exactly those weighings were. I did not specify finding whether the counterfeit was lighter or heavier than any of the other coins, but, in fact, that could be done in the minimum number of weighings.

You can always find a counterfeit coin among 12 and determine whether it is lighter or heavier in three weighings. Several entrants showed that, including James Klenke, Michael Paris, Bob and Cindy Bohland, Howard Jackson, S. B. Heberlig, Larry Stout, John Everett, and Rick Oshlo.

I also specified showing what those weighings were. Jeff Wisnia, of Winchester, Massacusetts, did so, for which he gets an honorable mention. Wolfgang Pelz, of Akron, Ohio, the January winner, did it nicely in interactive form, so no one could ever accuse the computer of "knowing" ahead of time what the answer was. Many who correctly solved the puzzle demonstrated that correctness by testing randomly generated counterfeit coins. OK by *me*, but I think an onlooker unfamiliar with computers would have needed more convincing.

Mathematicians solve this classic problem in various ways. One of those is by using ternary numbers, that is, numbers in base 3. Instead of 0, 1, and 2, this solution uses -1, 0, and +1, to represent, respectively, the left pan of the balance being heavier, the pans balancing, and the right pan being heavier. The program then converts these numbers back to 0, 1, and 2; transforms that into a number in base 10; and uses it

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CIRCLE 137 ON READER SERVICE CARD

as an index into an array of values.

Specifically, line 60 fills the array. Lines 80 through 140 guide the user through three weighings. (The same three sets of weighings always work.) Adding 1 to the number obtained for each weighing and concatenating those numbers produces a ternary number. For example, if coin 3 were heavy, the results of the weighings would be right heavy, left heavy, and right heavy, producing the three numbers 1, -1, and 1. Adding 1 to each and concatenating produces 202 as a base 3 number. Lines 110, 130, and 150 convert this number to its base 10 equivalent, that is SUM = (W1+1)*9 + (W2+1)*3 + (W3+1). SUM is 20 here; ARRAY(20,0) is 3 (coin number 3), and ARRAY(20,1) is 1 (light). If ARRAY(x,1) is -1, then the coin is heavy. An entry of 0 in ARRAY(x,1) is an unused base 3 number.

The ternary numbers in the array represent the results of all possible weighings. If you want a more detailed discussion than I have room for here of how those numbers were obtained, look at *Martin Gardner's Sixth Book of Mathematical Games from Scientific American* (New York, Scribner's, 1975; page 107). For a good discussion of using the symbols -1, 0, and +1 in what is called the "balanced ternary system," see Donald E. Knuth's *Seminumerical Algorithms* (New York, Addison-Wesley, 1969; pages 173–175).

Following the program listing below is a typical run, in which the user has determined ahead of time to input the results of weighings in which coin 12 is the counterfeit, and it is heavy.

If this sort of puzzle interests you, you might like trying to write a program that would find the counterfeit among *any* number of coins in the minimum number of weighings. I'll be glad to look at anything you come up with. ✚

JANUARY'S WINNING PROGRAM

```
10   DIM ARRAY(26,1)
20   DATA  1,-1,6,1,2,-1,8,1,7,1,4,-1,-3,-1,5,1,0,0,9,-1,10,1,11,
     1,12,1,0,0
30   DATA  12,-1,11,-1,10,-1,9,1,0,0,5,-1,3,1,4,1,7,-1,8,-1,2,1,
     6,-1,1,1
40   FOR I = 0 TO 26
50   FOR J = 0 TO 1
60   READ ARRAY(I,J)
70   NEXT J : NEXT I
80   PRINT "Enter the results of the weighings:"
90   PRINT "-1 (LEFT HEAVY), 0 (BALANCED),
     1 (RIGHT HEAVY)"
100  PRINT "LEFT:  1,2,3,4  - -  RIGHT:  5,6,7,8"
110  GOSUB 220 : SUM = (NUM + 1) * 9
120  PRINT "LEFT:  1,2,5,9  - -  RIGHT:  3,6,10,11"
130  GOSUB 220 : SUM = SUM + (NUM + 1) * 3
140  PRINT "LEFT:  1,3,9,11  - -  RIGHT:  2,4,8,12"
150  GOSUB 220 : SUM = SUM + NUM + 1
160  COIN = ARRAY(SUM,0) : TYPE = ARRAY(SUM,1)
170  IF TYPE = -1 THEN PRINT "Coin "; COIN; " is heavy"
180  IF TYPE = 1 THEN PRINT "Coin "; COIN; " is light"
190  IF TYPE = 0 THEN PRINT "You made a mistake -- try again"
200  END
210  REM Input checking routine
220  INPUT NUM
230  IF NUM * NUM <= 1 THEN RETURN
240  PRINT "input must be -1, 0, or 1 -- try again"
250  GOTO 220
```

```
Enter the results of the weighings:
-1 (LEFT HEAVY), 0 (BALANCED), 1 (RIGHT HEAVY)
LEFT:  1,2,3,4  - -  RIGHT:  5,6,7,8
? 0
LEFT:  1,2,5,9  - -  RIGHT:  3,6,10,11
? 0
LEFT:  1,3,9,11  - -  RIGHT:  2,4,8,12
? 1
Coin 12 is heavy
```

TIPS AND TECHNIQUES

Readers share tips for the II

WHO IS ROLAND?

In Print Shop Companion, side 2: When you try to boot, you will get a message saying that it is not a bootable disk and to press Return to boot another disk. If, instead, you press ESC and then Control-caret (^), you will end up in a game called Driver by Roland Gustafsson.

Also on the Print Shop Companion disk, side 1: Boot the program, and when the main menu appears, type STEVEN and then press ESC. The screen will do a mirror image flip, top to bottom.

Michael Paris
Atkinson, NE

ET, CALL HOME

Here is an Easter egg I recently discovered. In the AppleTerm II Modem Utility program, enter the command ET in the Terminal mode and read the reply. The obvious response? "Call home."

Allen Matheson
Pearland, TX

A BOOT FOR THE IIc EXTERNAL DRIVE

I own an Apple IIc with an external Disk IIc, a UniDisk 3.5, and a 512K Z-RAM II. Since the new IIc ROM does not let you use the PR#7 command to boot a disk from the external 5¼-inch disk drive, I had problems with my internal disk drive and decided to try to boot AppleWorks from my external disk drive.

On comparing the listing of the old IIc ROM and the new ROM, I noticed that the only thing keeping me from booting from the external disk drive was the code from $C700 to $C709. By changing the code at $C707 to 4C 0B C6 (which is the code listed at DODRV2), you can boot AppleWorks from the external disk drive.

From BASIC type CALL -151, and you will see an asterisk indicating that you are in the monitor. Enter the following modified $C700 routine at location $300 and then type 300G to run the program, which will boot the external disk drive:

```
] CALL -151

* 300: FF
* 301: A9 E0
* 303: A0 01
* 305: A2 60
* 307: 4C 0B C6

* 300G
```

I have booted several other ProDOS disks in this manner and all seem to work fine so far. Of course, this method still does not allow a DOS 3.3 disk to boot from the external disk drive.

Jeffrey L. Yoder
Las Vegas, NV

HYPERHACKER EGG

Here is a hidden Easter egg from the game Defender, designed by Joe Holt, available on Keypunch Software's Load n Go Space Games disk. To make the egg appear, you must reach 4000 or so points. After this hidden feature appears, press any key to continue playing the game.

Randy "Hyperhacker" Buist
Motherboard, USA

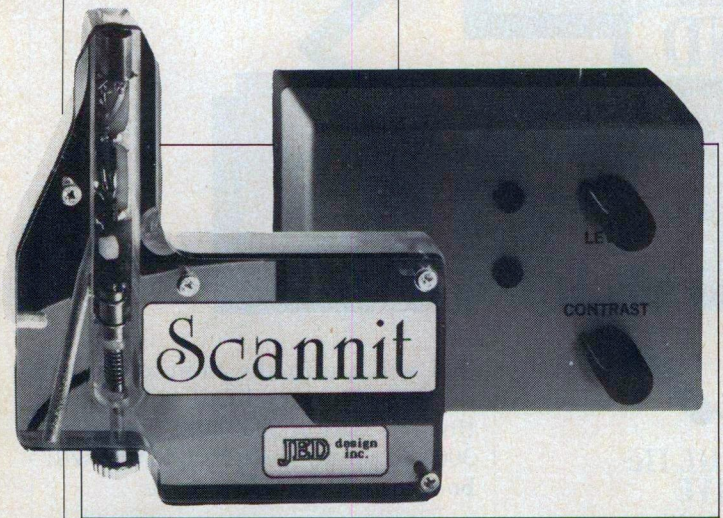
TWO-LINER: DEC/HEX

```
10  PRINT : PRINT : INPUT "HEX: ";A$: ON A$ = ""
    GOTO 20:V = 0: FOR J = 1 TO  LEN (A$):C =  ASC (
    MID$ (A$,J,1)): ON (C > 70 OR C < 48 OR (C > 57
    AND C < 65)) GOTO 10:V = V * 16 + C - 48 - 7 *
    (C > 64): NEXT : PRINT "DEC: ";V: GOTO 10
20  PRINT : PRINT : INPUT "DEC: ";A$:A =  VAL (A$):
    ON A = 0 GOTO 10:E$ = "": FOR I = 1 TO 99:B =
    INT (A / 16):C = (A / 16 - B) * 16:C$ =  CHR$ (C
    + 48 + 7 * (C > 9)):E$ = C$ + E$:A = B:I = I +
    99 * (B = 0): NEXT : PRINT "HEX: ";E$: GOTO 20
```

Henry Heatwole
Waynesboro, VA

Please send your Apple II tips to A+, 11 Davis Drive, Belmont, CA 94002; ATTN: Tips and Techniques. We will pay $25 for each tip we publish, so be sure to include your name, address, and social security number.

P I P E



The Scannit graphic digitizing system

SCANNIT

A complete graphic digitizing system, Scannit lets you enter pictures and drawings into your computer and enhance or alter them using a drawing program. The Scannit head replaces the cartridge in an ImageWriter printer and digitizes images as they are fed through the printer, displaying them on-screen. The interface connects to the computer's joystick port and contains level and contrast controls and indicators for power and active scanning. The system can generate hi-res and double-hi-res graphic files, is ProDOS compatible, and provides single-pass gray scaling. *(List Price: $219)*

Requires: Apple IIe or IIc, 128K RAM, 80 columns, Super Serial Card, ImageWriter

JED design, Inc.
3300 Central Avenue SE
Canton, OH 44707
(216) 484-1834

CIRCLE READER SERVICE NO. **501**

SEE THE U.S.A.

Designed for ages 8 through adult, See the U.S.A. teaches U.S. geography through three games. The package comprises 8 disks of software, a wall map, and a 46-piece puzzle of the U.S. The program creates cross-country trips and depicts characteristics of each state and capital, using more than 1 megabyte of art to provide a variety of full-screen graphics and illustrations. The program also asks players questions or lets them write their own, and provides hints and rewards correct responses. *(List Price: $59.95)*

Requires: Apple II Plus, IIe, or IIGS with 64K RAM and two disk drives, or Apple IIc with 128K RAM and one disk drive

The travel simulation program Ticket to London

Compu-Teach, Inc.
78 Olive Street
New Haven, CT 06507
(800) 44-TEACH
In CT (203) 777-7738

CIRCLE READER SERVICE NO. **502**

See the U.S.A. includes 8 disks, a wall map, and a 46-piece puzzle.

LINE

TICKET TO LONDON

Blue Lion Software has released Ticket to London, the second program in its line of travel simulations. The program casts you in the role of a tourist in London, letting you explore the British capital, visit museums, have tea at Fortnum & Mason's, shop in Portobello Road, or buy a ticket for a play. You also have a puzzle to solve, and in the process of solving it, you learn about London and Britain, history and tradition, books and plays, and more. The program features realistic graphics and makes sure that you receive new material every time you play. *(List Price: $39.95)*

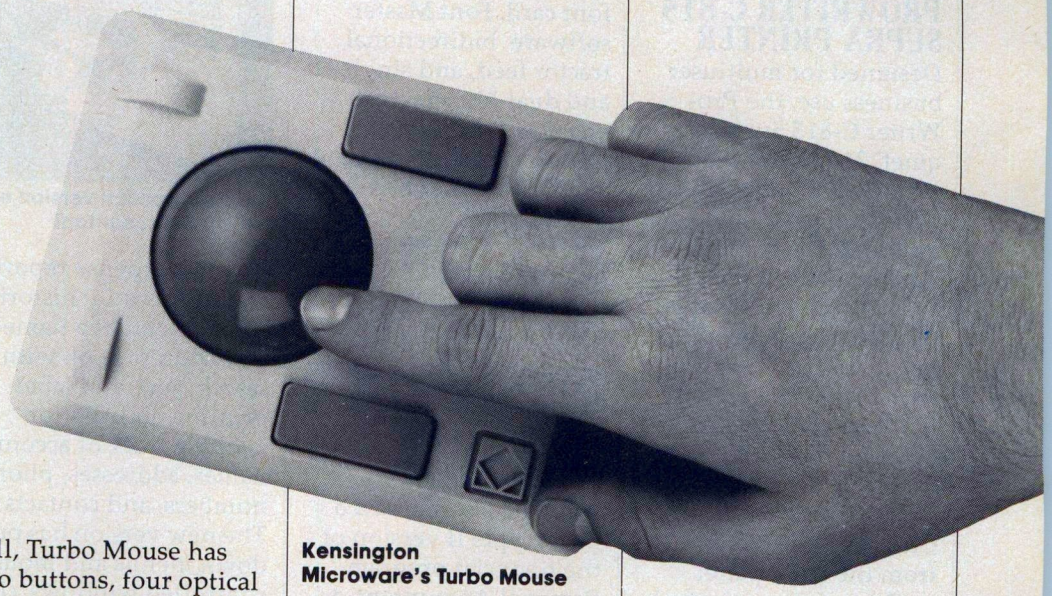
Requires: Apple IIe or IIc, 128K RAM

Blue Lion Software
P.O. Box 650
Belmont, MA 02178
(617) 489-2477

CIRCLE READER SERVICE NO. **503**

TURBO MOUSE

Kensington Microware's Turbo Mouse can perform all the functions associated with a standard mouse quickly, quietly, and easily. In Turbo Mouse, the mouse ball is on top rather than on the bottom, so users move only the mouse ball and not the whole mouse to control cursor movement. An automatic acceleration feature lets users control the speed of the cursor. In addition to the ball, Turbo Mouse has two buttons, four optical sensors, and a microprocessor, and it provides a second mouse port for users who want to keep their old mouse or joystick. *(List Price: $129.95)*



Kensington Microware's Turbo Mouse

Requires: Apple IIe or IIc

Kensington Microware Ltd.
251 Park Avenue South
New York, NY 10010
(800) 535-4242
In NY (212) 475-5200

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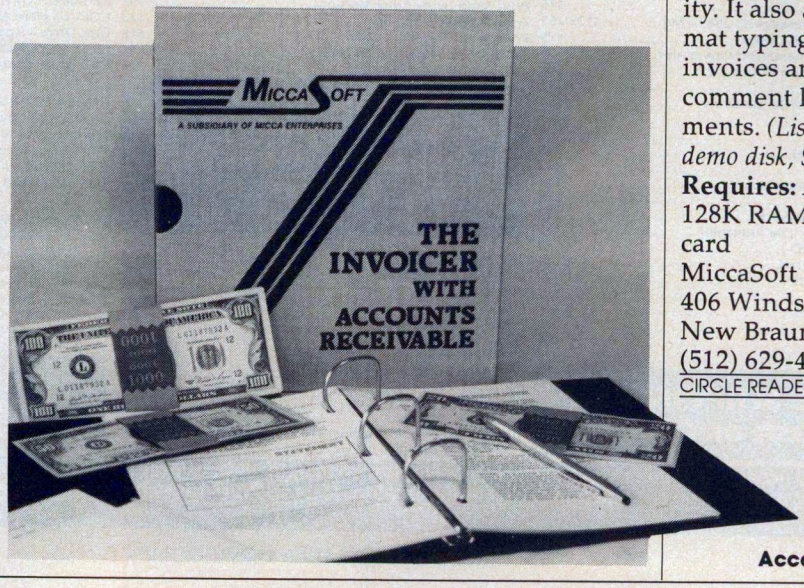
A full-featured invoicing and accounts-receivable system for small businesses, The Invoicer with Accounts Receivable's features include open-item or balance-forward systems and finance-charge capability by account. It also prints statements; past-due notices; invoices; numerous reports, such as aging, sales activity, collection, and posting; master customer and stock lists; labels; Rolodex cards; and more.

The program can handle either service or inventory invoicing, partial payments, credit memos, and unlimited sales activity. It also allows free-format typing of notes on invoices and an optional comment line on statements. *(List Price: $125; demo disk, $5)*

Requires: Apple IIe or IIc; 128K RAM; 80-column card

MiccaSoft
406 Windsor
New Braunfels, TX 78130
(512) 629-4341

CIRCLE READER SERVICE NO. **505**



MiccaSoft's The Invoicer with Accounts Receivable

PIPELINE

HARDWARE

PROWRITER C-815 SUPRA PRINTER

Designed for multiuser business use, the ProWriter C-815 Supra is a quiet, 24-pin dot-matrix printer that prints at up to 400 cps in draft mode and up to 162 cps in letter-quality mode. It features a special diamond-shaped printhead and incorporates a 16-bit 8086 chip with one megabyte of ROM and 64K of RAM. A 42K buffer is standard. Users can select all printer functions, including a Clear Buffer function, from the front panel.

Other features include a Copy+ function that lets it handle up to six-part forms, the ability to produce true circles for pie charts, bidirectional graphics print with a resolution of 180 × 360 dpi, built-in character fonts, enlarged printing, and tractor feed. Available as options are a download font card, Font Master software, bidirectional tractor feed, and single- and dual-bin sheet feeders. *(List Price: $1995)*

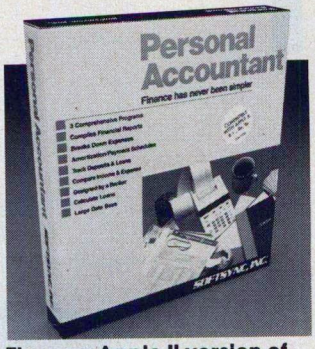
C. Itoh Digital Products
19750 S. Vermont Avenue
Suite 220
Torrance, CA 90502
(800) 423-0300
(213) 327-2110

CIRCLE READER SERVICE NO. **506**

SOFTWARE

PERSONAL ACCOUNTANT

Softsync has released a new Apple II version of the financial program Personal Accountant, a double-entry bookkeeping system for personal or small-business use. The program can generate professional financial reports, such as income statements, asset and liability statements, trial balance, expense reports, and full account histories. It also includes a name-and-address book with search, sort, and label-printing abilities for keeping track of account names, addresses, phone numbers, and contacts. The new version has pull-down menus and mouse-controlled windows. *(List Price: $49.95)*



The new Apple II version of Personal Accountant

Requires: Apple IIe (enhanced) or IIc, 128K RAM

Softsync, Inc.
162 Madison Avenue
New York, NY 10016
(212) 685-2080

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ACES

ACES (Athletic Conference Event Scheduler) is an easy-to-use program that helps athletic directors and coaches generate schedules for athletic conferences.

Designed for school use, the program can generate schedules for any situation that requires round-robin play. Users can enter up to 20 teams and 20 playing dates, the number of divisions in the conference, and how often teams play each other. The program then explores possible schedules until it generates one that meets users' requirements. *(List Price: $195)*

Requires: Apple IIe or IIc, 64K RAM

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Requires: Apple II Plus, IIe, IIc, or IIGS; 48K RAM; one disk drive; printer

The Home School
3611 Boundary Street
San Diego, CA 92104
(619) 284-9769

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Requires: Apple IIe, IIc, or IIGS; 128K RAM

Jackson Software
P.O. Bx 9101
Winnetka, IL 60093
(800) 247-8080, ext. 50

CIRCLE READER SERVICE NO. **510**

BY DEDINI

LAUGHTRACK

"Geez, Pop, *you* must have seen what *I* saw on the Bulletin Board tonight."

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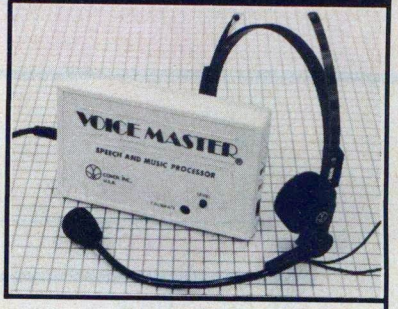

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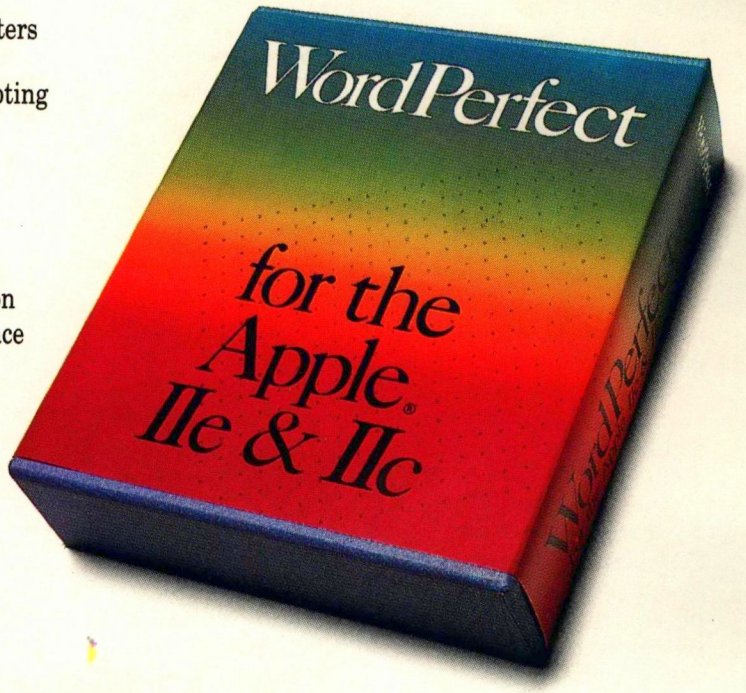

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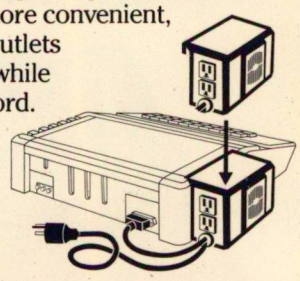

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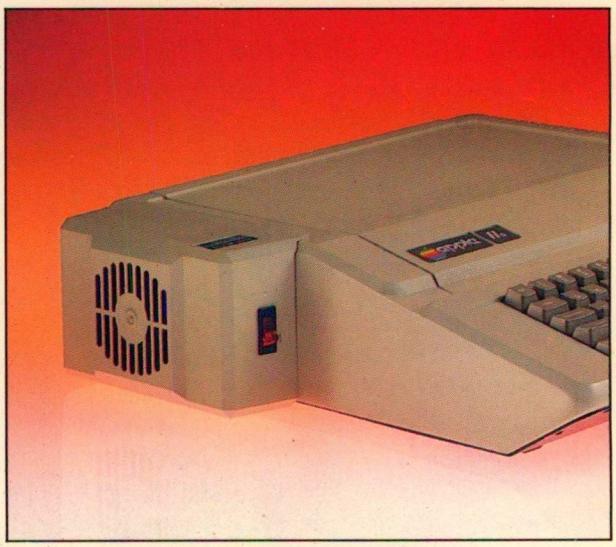

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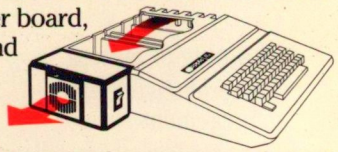

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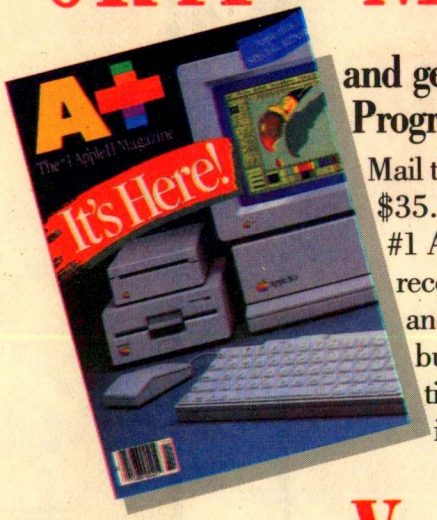

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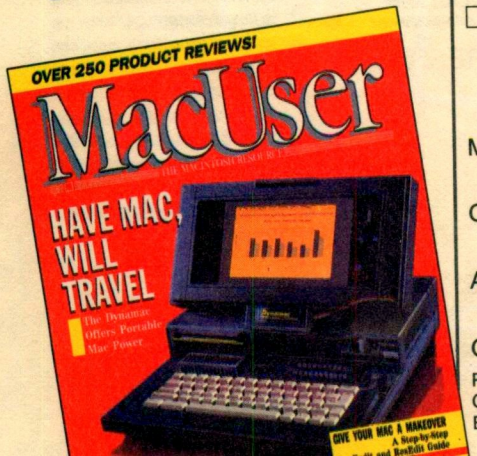

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